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Compilation of Industrial and Municipal Injection Wells in the United States. Volume 1

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This inventory updates a long list of earlier inventories by other regulatory agencies to chronicle the deep waste-injection well situation. As the effects of subsurface pollution are not well understood, it was necessary to gather all data possible regarding practices which may introduce materials to the subsurface. Information was collected for industrial and municipal deep well-injection systems using saline aquifers. Excluded from the inventory were oil field brine injection wells, storage wells and private domestic sewage wells. Comprehensive geologic settings, technical specifications, and operating procedures were recorded and stored in the STORET computer file. The collected data was assessed to determine current trends. A wide variety of waste waters are injected, including chemicals, petrochemicals, pharmaceutical products, hydrocarbon refining by-products, metal manufacturing wastes, and municipal sewage.

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Compilation of Industrial and Municipal Injection Wells in the United States

United States Environmental Protection Agency
Office of Water Program Operations
Oil and Special Materials Control Division
Special Sources Control Branch
Washington, D. C. 20460

14

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SUMMARY

Injection of industrial and municipal wastes by deep wells has been practiced for nearly 50 years, but it has been within the past ten years that this disposal technique has become greatly important as a method to diminish surface water pollution problems. This inventory updates a long list of earlier inventories by other regulatory agencies to chronicle the deep waste-injection well situation.

As the effects of subsurface pollution are not well understood, it was necessary to gather all data possible regarding practices which may introduce materials to the subsurface. Information was collected for industrial and municipal deep well-injection systems using saline aquifers. Excluded from the inventory were oil field brine injection wells, storage wells and private domestic sewage wells. Comprehensive geologic settings, technical specifications, and operating procedures were recorded and stored in the STORET computer file. The collected data was assessed to determine current trends.

Injection well development has been rapid since 1964, with an average of 23 new wells being drilled each year since that time. There currently exist 333 permitted industrial and municipal waste injection wells, of which 278 are drilled and 178 are operating. A wide variety of waste waters are injected, including chemicals, petrochemicals, pharmaceutical products, hydrocarbon refining by-products, metal munufacturing wastes, and municipal sewage. Three major injection zones; the Cambro-Ordovician Arbuckle

carbonates, the Cambrian Mt. Simon sandstone, and the unconsolidated Tertiary sands of the Gulf Coast are used as reservoirs for subsurface emplacement of waste water.

Deep waste-injection wells are constructed to a depth greater than 1,000 ft. (90% of the wells) and inject wastes at a rate less than 400 gpm (86% of the wells) with a surface pressure head less than 600 psig (78% of the wells). The waste water that is injected will travel less than 1,000 ft. after ten years of operation (97% of the wells) and nearly one mile in 50 years time.

INTRODUCTION

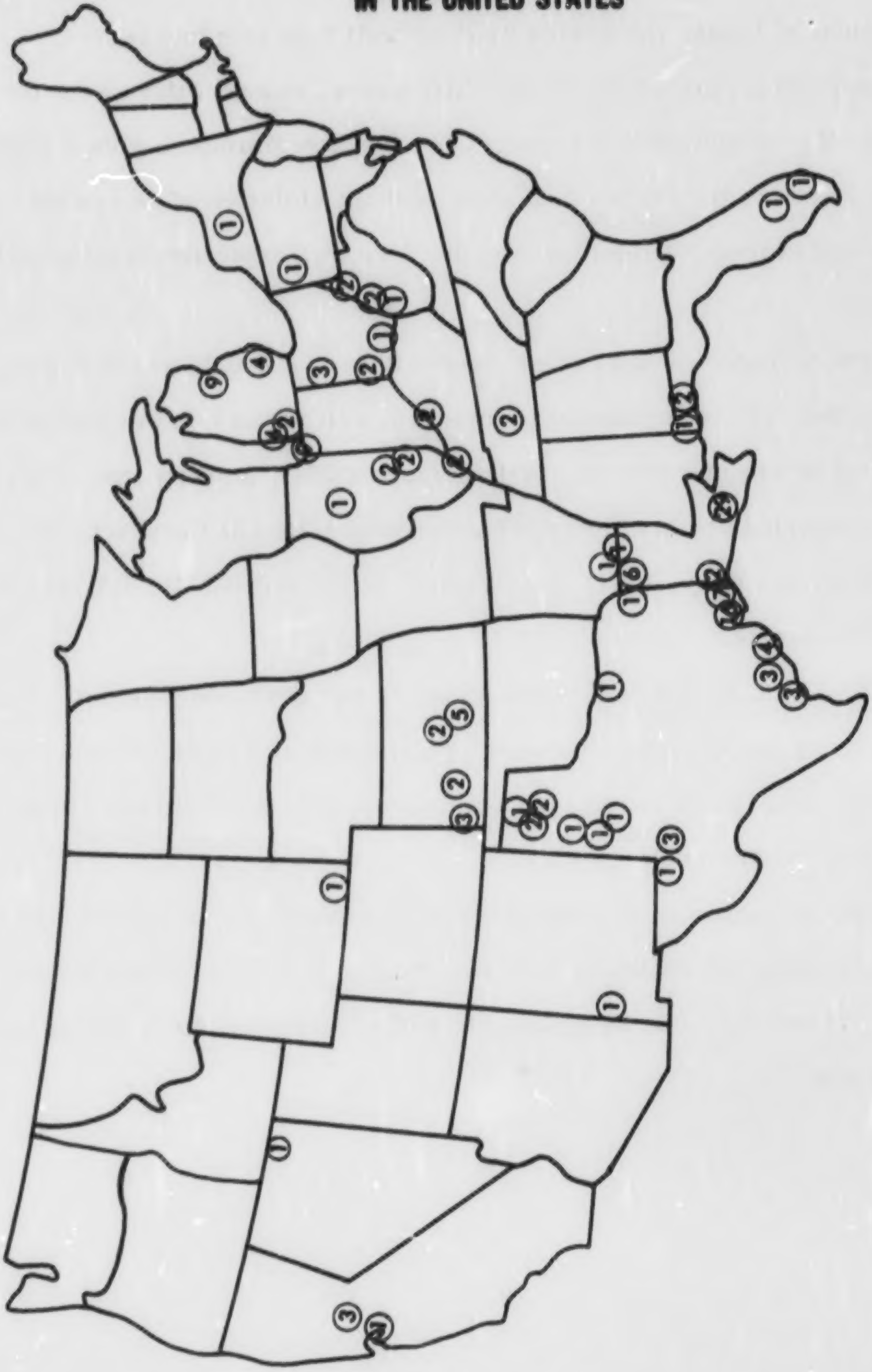
Disposal of industrial wastes by deep well injection has been recognized and practiced for nearly fifty years, though little attention was given this technique until the 1960's when the diminishing capabilities of surface waters to receive effluents, without violation of standards, made disposal and storage of liquid wastes by deep well injection increasingly more attractive.

Several inventories have been made within the past 10 years which document the ever changing waste injection well picture in the United States. The first of these inventories, by Donaldson (1964), showed only 30 wells. Later inventories, by Warner (1967), the Interstate Oil Compact Commission of 1968 (Ives and Eddy, 1968), and Warner (1972) showed 110, 118, and 246 wells respectively.

As of mid-1973, 278 deep disposal wells had been constructed. Another 44 wells had been permitted or were seeking permits to be drilled. Though this number may seem small, the volume and potency of wastes involved have caused considerable concern.

In order to facilitate the expansion and continuous analysis of injection well inventories, all collected data was stored in EPA's STORET computer system. These data will be updated to reflect new well completions and well changes.

FIGURE 1
OPERATING INJECTION WELLS
IN THE UNITED STATES



SCOPE OF THIS REPORT

It has become necessary to compile a comprehensive description of the geologic settings, technical specifications, and operating procedures of deep waste injection wells to be used in a ground water and deep injection well monitoring program. Data for this compilation was collected for EPA by a contractor and analyzed by the staff of the Special Sources Control Branch.

This compilation sought to assemble information for each industrial and municipal waste injection well site in the United States, constructed for injection into saline water aquifers whether in current use, proposed for future use, or abandoned. Oil field brine re-injection wells, injection wells for secondary recovery or extraction of minerals, and private domestic sewage disposal wells were excluded from this inventory.

The compilation was designed to provide general information for all deep well injection sites including:

- Facility location, operator and status of operation.
- Lithology and stratigraphy including storage capacities, fluid characteristics, hydrofracturing pressures, and hydrodynamics of the injection aquifer.
- Fresh-water, other useful aquifers, and mineral resources in the area.
- Specific waste characteristics.
- Technology, development, equipment and monitoring of the injection wells.

TABLE 1
PERMIT STATUS OF INJECTION WELLS

	TOTAL # WELLS PERMITTED	PDR	PDC	PDP	PNC	PND	DAP	AFP	SNA
ARKANSAS	1	1							
ALABAMA	5	5							
CALIFORNIA	5	5							
COLORADO	2	1		1					
FLORIDA	9	7						2	
HAWAII	4	3						1	
ILLINOIS	7	4	1					1	1
INDIANA	13	13							
IOWA	1	1							
KANSAS	16	15		1					
KENTUCKY	3	2		1					
LOUISIANA	77	44		5	3	24	1		
MICHIGAN	34	27		5					2
MISSISSIPPI	1	1							
NEVADA	1	1							
NEW MEXICO	1	1							
NEW YORK	4	2		1				1	
NORTH CAROLINA	4	3		1					
OHIO	9	7		1					1
OKLAHOMA	14	8	1			3	2		
PENNSYLVANIA	9	2		7					
TENNESSEE	3	3							
TEXAS	104	62	5	8	9	20			
WEST VIRGINIA	6	5	1						
WYOMING	1	1							
TOTAL	333	223	7	32	12	47	3	5	4

KEY:

PDR	PERMITTED, DRILLED
PDC	PERMITTED, DRILLED, CANCELLED
PDP	PERMITTED, DRILLED, PLUGGED
PNC	PERMITTED, NOT DRILLED, PERMIT CANCELLED
PND	PERMITTED, NOT DRILLED
DAP	DRILLED, APPLYING FOR PERMIT
AFP	APPLYING FOR PERMIT
SNA	STATUS UNKNOWN

TABLE 2
OPERATING STATUS OF INJECTION WELLS

	TOTAL # WELLS	O	NOP	NOUP	DN	PND	PC
ARKANSAS	1	1					
ALABAMA	5	1			4		
CALIFORNIA	5	4	1	1			
COLORADO	2			1			
FLORIDA	9	4		1	2	2	
HAWAII	4	1			2	1	
ILLINOIS	7	5			1	1	
INDIANA	13	11		1	1		
IOWA	1			1			
KANSAS	16	13		2	1		
KENTUCKY	3	2	1				
LOUISIANA	77	40	5	2	3	26	1
MICHIGAN	32	21	4	2	5		
MISSISSIPPI	1	1					
NEVADA	1	1					
NEW MEXICO	1	1					
NEW YORK	4	1			3		
NORTH CAROLINA	4		1		3		
OHIO	9	6	1		2		
OKLAHOMA	14	8		1	4	1	
PENNSYLVANIA	9	1	3	2	3		
TENNESSEE	4	2		1	1		
TEXAS	104	47	5	8	21	13	10
WEST VIRGINIA	6	5	1				
WYOMING	1	1					
TOTAL	333	178	22	23	55	44	11

KEY:	
O	OPERATING
NOP	NOT OPERATING, PLUGGED
NOUP	NOT OPERATING, UNPLUGGED
DN	DRILLED, NEVER USED
PND	PERMITTED, NOT DRILLED
PC	PERMIT CANCELLED, NEVER DRILLED

CURRENT SITUATION

As of mid-1973, there are known to exist at least 333 waste injection sites located in 25 states (Fig. 1, Table 1). Table 1 shows the division of these well sites according to known permit status. Three hundred and twenty-one (321) wells have been permitted to operate. These wells may be presently operating, may not yet be operating, or can have operated in the past but not now. To clarify the current operational situation Table 2 was developed.

Of 333 sites listed, 278 have waste injection wells constructed on them. Over sixty percent (178) are presently being used for deposition of wastes to the subsurface. An additional 45 wells have been used at some time in the past for deposition of wastes. It is safe to assume that municipal and industrial wastes have been disposed in at least 223 wells in the United States and, in the near future, nearly 100 more sites may be used.

Prior to 1964, 67 deep waste-injection wells had been drilled, and of these, 52 had been operated. Within the past 10 years well development has progressed rapidly. An average of 23 new wells were drilled each year during this time and of these, 19 were put into operation (Table 3, Fig. 2-4). Such rapid development has concerned Federal, State and local governments because of the many uncertainties of pollution resulting from deep well waste injection.

Chemical, petrochemical and pharmaceutical plants are the largest users of waste injection wells (48.9%), with petroleum and gas extraction, and the refining of these second (25.4%) primary metal plants are third (5.9%)

FIGURE 2

INJECTION WELLS DRILLED IN U.S.

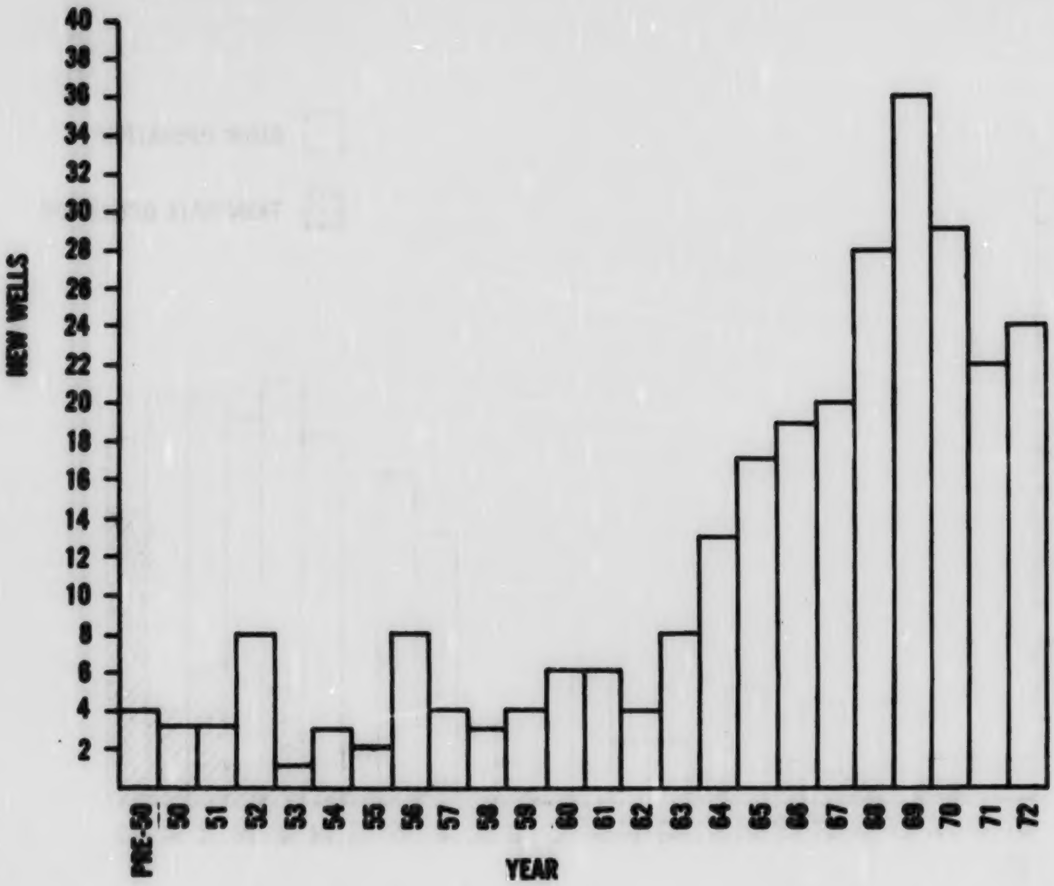


FIGURE 3

INJECTION WELL OPERATIONS BEGUN AND TERMINATED IN U.S.

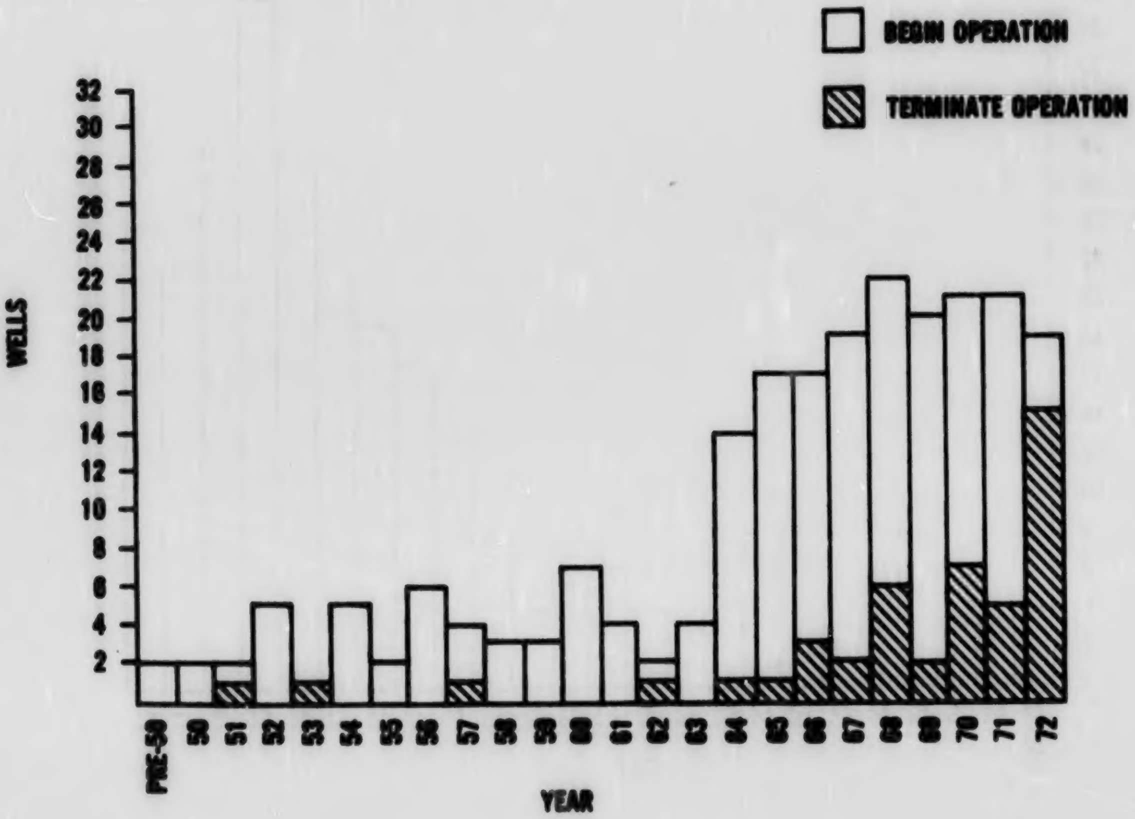


FIGURE 4

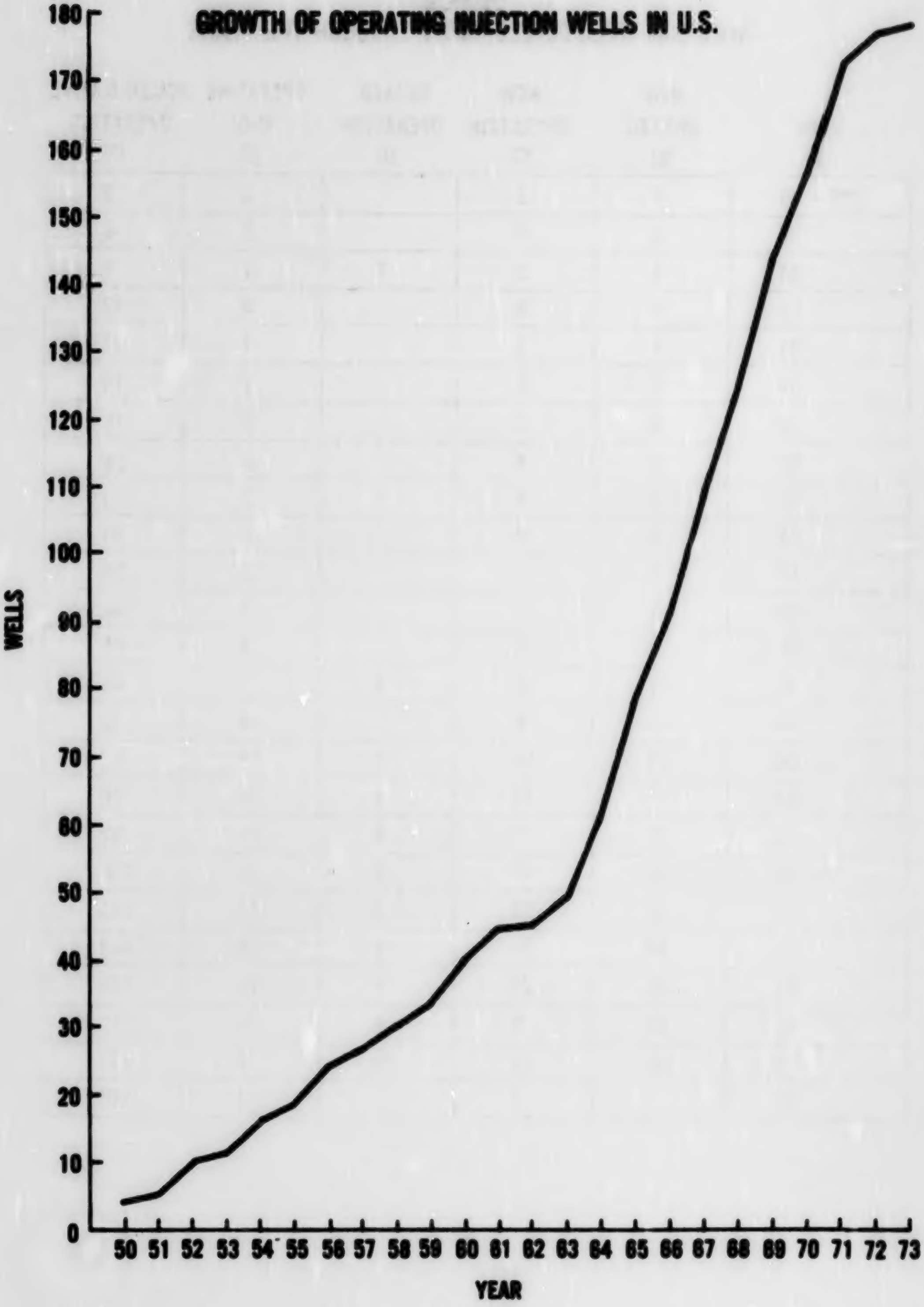

GROWTH OF OPERATING INJECTION WELLS IN U.S.

TABLE 3
INJECTION WELL DEVELOPMENT THROUGH THE YEARS

YEAR (A)	NEW DRILLED (B)	NEW OPERATION (C)	CEASED OPERATION (D)	OPERATING (C-D) (E)	ACCUMULATIVE OPERATING (F)
PRE - 50	4	2		2	2
50	3	2		2	4
51	3	2	1	1	5
52	8	5		5	10
53	1	1		1	11
54	3	5		5	16
55	2	2		2	18
56	8	6		6	24
57	4	4	1	3	27
58	3	3		3	30
59	4	3		3	33
60	6	7		7	40
61	6	4		4	44
62	4	2	1	1	45
63	8	4		4	49
64	13	14	1	13	62
65	17	17	1	16	78
66	19	17	3	14	92
67	20	19	2	17	109
68	28	22	6	16	125
69	36	20	2	18	143
70	29	21	7	14	157
71	22	21	5	16	173
72	24	19	15	4	177
73		1		1	178

(Table 4). Sanitary service industries account for 8.6% of the injection wells used, into which a wide variety of wastes ranging from municipal sewage to petrochemicals are injected.

Experience has shown that nearly all types of rock can, under favorable circumstances, have sufficient porosity and permeability to yield or accept large quantities of fluids. Characteristics looked for when an aquifer is to be used for the injection of liquid wastes are: (1) a zone with sufficiently permeability, porosity, thickness, and areal extent to act as a liquid storage reservoir; and (2) a zone which is vertically below fresh water circulation and is confined vertically by rocks that are impermeable to waste liquids.

Three major zones of injection exist in the United States. Tertiary sands of the Gulf Coastal geologic province provide the primary injection zone for wells in Texas, Louisiana, and Alabama. The Cambro-Ordovician Arbuckle carbonate group of the central plains is used in Kansas and Oklahoma, and injection in Michigan, Ohio, Indiana, and Illinois is made into the Cambrian Mt. Simon sandstone.

Sands and sandstones are most commonly used as injection aquifers (62.1%), with carbonates second (33.8%). Evaporites, shales and metamorphics comprise the remaining four percent (Table 5). The age of these injection aquifers range from Tertiary to pre-Cambrian. One hundred and six (106) wells are completed in rock of Tertiary age. Of these 93 are completed in unconsolidated sand and sandstone and the rest (13) in limestone or evaporite. Only 20 wells are completed in Mesozoic age rock and are primarily into sandstone (19 wells). Rock of Paleozoic age are used most

TABLE 4

STANDARD INDUSTRIAL CLASSIFICATION
OF INJECTION WELLS
(268 WELLS)

		WELLS	PERCENTAGE
MINING (9.3 %)			
10	METAL MINING	2	.7
12	COAL	1	.4
13	OIL & GAS EXTRACTION	17	6.4
14	NON-METALLIC MINING	5	1.9
MANUFACTORING (80.6 %)			
20	FOOD	6	2.2
26	PAPER	3	1.1
28	CHEMICAL & ALLIED PRODUCTS	131	48.9
29	PETROLEUM REFINING	51	19.0
32	STONE & CONCRETE	1	.4
33	PRIMARY METALS	16	5.9
34	FABRICATED METALS	3	1.1
35	MACHINERY - EXCEPT ELECTRONICS	1	.4
36	ELECTRONICS	1	.4
38	PHOTOGRAPHICS	3	1.1
TRANSPORTATION, GAS, AND SANITARY SERVICES (9.8 %)			
47	TRANSPORTATION SERVICE	1	.4
49	SANITARY SERVICE	23	8.6
50	WHOLESALE TRADE - DURABLE	1	.4
55	AUTO DEALERS & SERVICE	1	.4
OTHER (.4 %)			
72	PERSONAL SERVICE	1	.4

TABLE 5

RESERVOIR ROCK TYPE AND AGE
(269 WELLS)

	(%)	SAND & SANDSTONE	CARBONATE	EVAPORITE	SHALE	OTHER
TERTIARY	39.4	93	11	2		
CRETACEOUS		19				
JURASSIC	7.4					
TRIASSIC		1				
PERMIAN		12	14	2		
PENNSYLVANIAN		5	2			
MISSISSIPPIAN		4	1			
DEVONIAN	52.8	10	21		1	
SILURIAN		1	3	4		
ORDOVICIAN		2	20			
CAMBRIAN		20	19		1	
pre-CAMBRIAN	.4					1
TOTAL (269)		167	91	8	2	1
%		62.1	33.8	3	.7	.4

often (143 wells), including sandstones (55), carbonates (80), evaporites (6) and shales (2). One well is completed in pre-Cambrian metamorphics (Table 5).

Vertical separation of injection zone and potable water is requisite. If the injection zone is at least 1,000 ft. (300 m.) below land surface, one or more rock strata which are sufficiently impermeable to vertical movement of wastes should be present to allow protection of potable waters. In 90 percent (242) of the wells completed the injection zone is located at least 1,000 ft. (300 m.) below land surface (Table 6).

Wastes should also be separated horizontally in the aquifer from any potable water which may occur in the aquifer. No data is available to indicate presence of fresh water in the aquifers used for injection or its separation from the waste fluid.

Pressures of 0.5 - 1.1 psi/ft. of depth are necessary to fracture most sedimentary rock. Well-head injection pressures of less than 600 psi (40 ksc) are required for injection by 78 percent of the wells. This relatively low pressure head should not fracture most rock into which the waste is currently being injected if the well is over 1,200 feet deep.

About 70 percent of present wells inject waste at a rate less than 200 gpm (15 lps) and 86 percent less than 400 gpm (30 lps). This is a relatively low rate and should be expected as the range for future injection wells.

Distance of waste water travel was calculated for 143 (53.2%) wells for which sufficient data was available to make such calculations. Two calculations were made to determine radial distance of travel without and with dispersion. The radial distance of movement without dispersion was determined from the equation:

TABLE 6

WELL COMPLETION DEPTHS (262 WELLS)

DEPTH	# WELLS	PERCENTAGE
0 - 1000 FT	20	7.6
1001 - 2000	56	21.4
2001 - 3000	33	12.6
3001 - 4000	34	12.8
4001 - 5000	39	14.8
5001 - 6000	44	16.7
6001 - 7000	18	7.2
7001 - 8000	12	4.6
8001 +	3	1.2

(1) $r = \sqrt{\dfrac{Qt}{\pi b \phi}}$

Where: r = radial distance of travel (ft.)

Q = injection rate (cfs)

t = time since injection began (sec)

π = 3.1416

b = acquifer thickness (ft)

ϕ = aquifer porosity.

This equation represents minimum distance of travel and was calculated for 5, 10, and 50 years (Table 7). Within ten years, and in 97 percent of the cases the waste water will have traveled not more than 3,000 ft. (1,000 m) producing a cone of influence covering less one square mile. After 50 years the waste water will have traveled less than one mile (1.6 km) producing a cone of influence less than 3 square miles in area.

The radial distance of travel with dispersion is slightly greater than without and is calculated from:

(2) $\bar{r} = r + 2.3\sqrt{Dr}$

Where: $\bar{r}$ = radial distance of travel with dispersion (ft)

D = Coeffecient of dispersion (ft)

r = value from eq. (1)

(This equation is simplified from the solution to the differential equation for radial dispersion and if for the point at which C/Co = 0.002.)

No actual values for D are available for any existing injection wells, so high values were used for limestone (65 ft) and sandstone (3 ft) as determined by other field studies. The reliability of the calculation depends upon the

TABLE 7

DISTANCE OF WASTE WATER TRAVEL CALCULATED FOR ACTUAL CONDITIONS USING EQUATIONS (1) AND (2)

(146 WELLS)

WITHOUT DISPERSION	10 YEARS		50 YEARS	
0 - 1000 FT	87	97.2%	34	97.2%
1001 - 2000	44		46	
2001 - 3000	11		27	
3001 - 4000	2		15	
4001 - 5000	0		13	
5001 - 6000	2		7	
6001 - 7000	0		0	
7001 - 8000	0		2	
8001 - 15,000	0		2	

WITH DISPERSION	10 YEARS		50 YEARS	
0 - 1000 FT	68	96%	23	96%
1001 - 2000	58		44	
2001 - 3000	15		32	
3001 - 4000	2		17	
4001 - 5000	1		11	
5001 - 6000	0		10	
6001 - 7000	2		1	
7001 - 8000	0		2	
8001 - 15,000	0		3	

fact that there is no great difference in density or viscosity of the injected fluid and the reservoir fluid, there is not a high rate of natural flow in the aquifer, and the fluids are miscible. In cases where one or more of these constraints is violated, the maximum distance of travel could be considerably more than calculated.

In 96 percent of the cases 10 year estimated movement is less than 3000 feet (1,000 m). After 50 years the distance of travel will be less than 6000 feet.

Following this section is the data collected and used in this compilation and analysis. The information is separated by state and well identification numbers follow the system developed by Warner (1972). For information on recovering the data from STORET contact the STORET User Assistance Group, Division of Monitoring and Data Support, EPA Headquarters.

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Data

The following data is arranged alphabetically by state and numerically within each state to following the system developed by Warner (1972). The data is presented in a four (4) page format; each page is labelled a-d. In the event that sufficient data is lacking to complete a page of this format that page has been deleted.

The codes used with permit status and operating status are those used in Tables 1 and 2 respectively.

This data is also available through the STORET/GPSF computer file of EPA. Information on retrieval may be obtained from the STORET User Assistance Group, Division of Monitoring and Data Support, EPA Headquarters.

Well Id. Code: AL-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Stauffer Chemical Company
Bucks, Alabama

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°58'25"/88°01'05"
3. Well Location (Legal Description): 2056.3 ft. north of the south line and 868.2 ft. east of the west line, SE 1/4, Sec. 7, T1S, R1E
4. County: Mobile State: Alabama
5. SIC Classification: 2879

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Industrial and agricultural chemical manufacturing waste.
2. Date Well Permitted: 2/69 Completed:
3. Injection Rate: 72,000 gpd
4. Injection Pressure: 310 psi
5. Total Depth of Well: 4300 ft.
6. Name, Age, and Depth of Injection Zone: Midway, Paleocene, 3880-3910 ft
7. Date Injection Began: (Day) (Month) 08 (Year) 69
8. Total Volume Injected to Date: 84,043,440 (2/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Pumped into Cold Creek- a tributary of the Mobile River

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium	Recent	0	40	unconsolidated
Miocene Sands	Miocene	400	660	sand
Chickasaway	Oligocene	1060	90	limestone
Byram-Bucatunno	Oligocene	1150	120	clay
Jackson	U. Eocene	1270	120	
Moody's Branch	U. Eocene	1390	120	
Claiborne	M. Eocene	1510	570	
Tallahatta	M. Eocene	2080	420	
Wilcox	L. Eocene	2500	720	
Nanafolia	L. Eocene	3220	600	
Salt Mountain	L. Eocene	3820	60	limestone
Midway	Paleocene	3880	30	sand

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Wilcox	various units
(2) Depth (Ft.)	3400	1200
(3) Thickness (Ft.)	80	2200
(4) Formation Fluid Pressure, psi	1418	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	0.82 psi/ft	
(7) Age of Unit	Paleocene-Eocene	Tertiary
(8) Porosity %	34	
(9) Permeability, millidarcies	400	
(10) Reservoir Temperature, °C	52	
(11) Character and Areal Distribution	sands of extensive areal distribution	clays and sands

C. Chemical Characteristics of Formation Fluids: saline - 88,000 ppm chloride

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Recent-Miocene	0	1200		unconsolidated	potable
Wilcox	2500	720	extensive	sand	saline
Midway	3880	30	extensive	sand	saline

4. Mineral Resources in Area: Oil production from the following fields: Citronella, South Carlton, and Tensaw Lake. Salt from the McIntosh salt dome

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: None

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Industrial and agricultural chemical manufacture waste - alkaline wastewater containing small amounts of chlorides and phosphorus

2. Physical/Chemical Description

A. Conc. Suspended Solids, mg/l: N/A
B. Conc. Dissolved Solids, mg/l: 39,000
C. Specific Gravity: 1.036-1.112 average 1.06
D. Temperature: N/A
E. pH: 10.4

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: None

7. Pre-injection Waste Treatment: Filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	32.7#/ft, H-40, ST&C	10 3/4	1238
Intermediate	9 7/8	23#/ft, J-55, ST&C	7	4216
Injection		9.5#/ft, H-40	4 1/2	3401
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10 3/4"- 250 sks 50-50 Litepoz w/4% gel, 3% CaCl, 225 sks 50-50 Litepoz w/ 4% gel and 3% CaCl, 200 sks Class H common w/ 3% CaCl. 7 inch casing - 276 sks 50-50 Litepoz w/ 10% gel, 300 sks Class H common.

3. Well Head Equipment (Name and Models): Head, CM 10 3/4" OD 8RD X 7" OD w/ accessories. Head, T-16, 7" OD 8RD X 4 1/2" OD

4. Packers, Centralizers, and Other Subsurface Equipment: Centralizers for 10 3/4" casing at 1235, 1147, 945, 800, 754, and 612 feet. Packer - Baker model A-1 Lok-set at 3393 feet.

5. Bottom Hole Completion: Perforations of 7 inch casing.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Periodic acid treatment necessary to maintain injection capacity.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Holding tanks before and after filters.

2. Filters: Leaf type - 1 to 2 micron with diatomaceous earth

3. Pumps: Transfer and injection approx. 100 gpm

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
Nov., 1969	38	74
" June, 1970	66.4	81
" July, 1972	49.2	90
" Oct., 1972	77.8	100

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
Nov., 1969	258	295
" June, 1970	324	460
" July, 1972	312	425
" Oct., 1072	456	505

3. Annual Volume Injected, gal.
A. 1972 27,713,520 B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous monitoring of well head pressure, flow to well, specific gravity, pH, and inner annulus pressure.

B. Sampling Frequency and Water Quality Parameters Measured: Continuous - pH, specific gravity, Cl, and phosphorus

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Injection pressure monitored continuously.

2. Contingency Plan for Well Failure During Operation: Surface storage.

3. Regulatory Aspects

A. Construction Requirements: All fresh water must be cased off and all mineral resources must be protected. Injection horizon must be between aquicludes.

B. Monitoring Requirements: Continuous monitoring of injection pressure, flow to well, specific gravity, pH, inner annulus pressure.

C. Restrictions of Operation Procedures: Injection pressure may not exceed .81 psi/ft. The environment must be protected to the maximum extent possible.

Well Id. Code: AL-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: U.S. Steel Corp., Fairfield Works,
Fairfield, Alabama

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 33°29'40"/86°57'40"
3. Well Location (Legal Description): 438.5 ft. east and 279.5 ft. south of the NE corner, NW 1/4, SW 1/4, Sec. 10, T18S, R4W
4. County: Jefferson State: Alabama
5. SIC Classification: 3323

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Pickle liquor waste - dilute H_2SO_4, $FeCl_2$ and $FeSO_4$
2. Date Well Permitted: 3/70 Completed:
3. Injection Rate: 150 gpm
4. Injection Pressure: N/A
5. Total Depth of Well: 6060 ft
6. Name, Age, and Depth of Injection Zone: Chickamauga-Copper Ridge, Ordovician, 4643-6060 ft
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Surface stream - Opossum Creek a tributary to the Black Warrior River

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Pottsville	Pennsvlvanian	0	3354	siltstone, shale, coal
Bangor	Mississippian	3354	220	limestone, shale
Hartselle	Mississippian	3574	181	sandstone
Gasper	Mississippian	3755	34	shale
Tuscumbia	Mississippian	3789	108	limestone
Ft. Payne	Mississippian	3897	261	limestone, chert
Red Mountain	Silurian	4158	485	sandstone, limestone
Chickamauga	Ordovician	4643	277	dolomite
Copper Ridge	Ordovician	4920	1140	dolomite
Knox	Camb.-Ord.	5400		dolomite

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit		Confining Bed
(1) Name	Red Mt.	Knox	
(2) Depth (Ft.)	4415	5550	1200
(3) Thickness (Ft.)	215	220	3200
(4) Formation Fluid Pressure, psi	970		
(5) Lithostatic Pressure, psi			
(6) Hydrofracturing Pressure, psi			
(7) Age of Unit	Sil.	Camb-Ord.	Penn-Miss.
(8) Porosity %	fracture		
(9) Permeability, millidarcies	fracture		
(10) Reservoir Temperature, °C			
(11) Character and Areal Distribution	sandstone and dolomite extensive		shale, limestone, sandstone - extensive

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Pottsville	0	1200		siltstone	fresh to brackish

4. Mineral Resources in Area: Coal, iron ore, and limestone are mined in the immediate area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: None

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Spent steel pickling liquor. Primarily $FeCl_2$ or $FeSO_4$ depending on the process that is used.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Decanting, skimming, two stage filtering.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	65# H-40		64
Intermediate	13 3/4	32.75# H-40	10 3/4	1110
	9 5/8	26.4# N-80	7 5/8	4415
Injection		tubing	2 7/8	4434
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: Surface - cemented to top; 10 3/4 casing - cemented to surface; 7 5/8 casing-cemented 2720-4415 feet.

3. Well Head Equipment (Name and Models): 7" x 4 1/2" Type 2S tubing head to accomodate a 4 1/2" diameter fibercast tubing.

4. Packers, Centralizers, and Other Subsurface Equipment: Centralizers at 1094, 1066, 864, 737, 585, and 377 feet. Cement basket at 377 ft.

5. Bottom Hole Completion: Acidized and swabbed 5525-6060 ft. open hole.

6. Hydraulic Fracturing, Acidizing Programs, etc.: 5,000 gals. HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Small storage tank for filtered wastewater.

2. Filters: Rough filtering through sand and/or anthracite. Second stage filtering through diatomaceous earth leaf-type.

WIC AL-2

3. **Pumps:** 150 gpm and 1600 psig. Annulus water pump.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. **Monitoring Devices and Data:** Continuous well head monitoring of injection temperature, pressure, volume, rate, and annulus pressure - continuous water level record of monitor wells.

B. **Sampling Frequency and Water Quality Parameters Measured:** Monthly sample from monitor water well, 90 day deep injection monitor well sample, springs + wells within 2 mi. radius 90 days.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuous

2. **Contingency Plan for Well Failure During Operation:** Surface storage and present acid neutralizing plant.

3. Regulatory Aspects

A. **Construction Requirements:** As constructed - all surface water cased off and all mineral or potential mineral resources protected.

B. **Monitoring Requirements:** Fresh water zones, injection rate and pressure and casing, tubing, and annulus pressure.

C. **Restrictions of Operation Procedures:** Only spent pickling liquor must be disposed. 0.81 psi/ft/

Well Id. Code: A1-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Reichhold Chemical Company, Tuscaloosa, Alabama

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day)______ (Month)______ (Year)______
2. Latitude and Longitude: 33° - 15' - 05" / 87° - 28' - 24"
3. Well Location (Legal Description): Northeast 1/4 sec. 3, T. 21S, R 9W about 7 miles northeast of the center of Tuscaloosa near Holt, Alabama
4. County: Tuscaloosa State: Alabama
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: waste water containing sodium sulfite and sulfate, phenol, caustic, and traces of organic chemicals
2. Date Well Permitted: 8/70 Completed:______
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 8097
6. Name, Age, and Depth of Injection Zone: undifferentiated, silurian-ordovician 6070 - 7480
7. Date Injection Began: (Day) N/A (Month)______ (Year)______
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month)______ (Year)______
10. Previous Mode of Disposal: Black Warrior River

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Pottsville	Pennsylvanian	80		sand, shale, siltstone
Parkwood	Mississippian	4390	475	shale, siltstone
Floyd	Mississippian	4865	765	shale, limestone
Ft. Payne	Mississippian	5630	195	limestone, chert
Chattanooga	Devonian	5825	45	shale, cherty limestone
Pre-Chattanooga	Devonian	5870	200	shale, cherty limestone
undifferentiated	Silurian	6070	564	limestone
undifferentiated	Ordovician	6634	846	dolomite - limestone
Knox Group	Cambrian-Ord	7480		dolomite - limestone

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	undifferentiated	Chat. & Pre-Chat. Shale
(2) Depth (Ft.)	6070	4390
(3) Thickness (Ft.)	1410	1700
(4) Formation Fluid Pressure, psi	3200	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	0.8 psi/ft.	
(7) Age of Unit	Silurian-Ordovocian	Devonian
(8) Porosity %	1.5-3.0	
(9) Permeability, millidarcies	Fracture Permeability	
(10) Reservoir Temperature, °C	74°C @8050	
(11) Character and Areal Distribution	sandstone, dolomitic limestone, porous zone	shale, limestone

C. Chemical Characteristics of Formation Fluids: From 6986-7465 feet level Ca-6600ppm, Mg-1600 ppm, Na-25000 ppm, K-1040 ppm, Cl-563,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	80		Limestone & Dolomite	fresh
Pottsville	80	2920	Extensive	sandstone	fresh

4. Mineral Resources in Area: coal beds occur in the Pottsville formation

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: None

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): wastewater containing sodium sulfite and sulfate, phenol, caustic, and traces of organic chemicals
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. **Toxicity:** Phenol fatal at 1.59m total dose sodium sulfite possibly toxic at high concentrations

4. **Reactivity with Surface Equipment Components:** Possible corrosion in caustic solution

5. **Degradability Level and Rate:** Possible breakdown of phenol and organics (Degradation of phenol and organics may occur utilizing SO_4= and SO_3 - as electron sources.)

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Bacteria may be inhibited by phenol (destroyed at high phenol concentrations)

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	H-40 65#/ft.	16	45
Intermediate	13 3/4	H-40 33#/ft.	10 3/4	1220
	9 5/8	K-55 26#/ft.	7	5920
Injection		H-80 6.4#/ft.	2 7/8	5923
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16 inch casing - 150 sks Port A & Pozmix; 10 3/4 inch casing - 500 sks litewate cement; 7 inch casing - bottom to 4150 ft. cemented

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Baker tubing anchor at bottom of tubing string, centralizers for each casing string.

5. Bottom Hole Completion: open hole - permeable zones are at 6620-6670 and 7036-7230

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: continuous monitoring of injection press, casing - tubing annulus press, pH, flow rate, spec. gravity; use of corrosion tags, seismic monitoring

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Surface Storage

3. Regulatory Aspects

A. Construction Requirements: All fresh water cased off. All mineral resources protected.

B. Monitoring Requirements: Max. pressure gradient of 0.65 per foot of depth

C. Restrictions of Operation Procedures: N/A

Well Id. Code: A1-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: Ciba-Geigy Inc.
McIntosh, Alabama

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 31° - 16' - 45" / 87° - 59' - 32.4"
3. Well Location (Legal Description): Sec. 41, T4N, R1W
4. County: Washington State: Alabama
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: dilute hydrochloric acid and other organic and inorganic wastes including diazines, chlorobenzilate, and triazines
2. Date Well Permitted: 10/31/70 Completed:
3. Injection Rate: 1000 gpm
4. Injection Pressure: N/A
5. Total Depth of Well: 7513
6. Name, Age, and Depth of Injection Zone: Wilcox Group, Eocene, 2340-4260
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Alabama River

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Undifferentiated	Oligocene	1050	180	clay, sand, shale,
Jackson Group	Eocene	1230	210	clay, sand, shale
Claiborne Group	Eocene	1440	720	clay, sand, shale
Tallahatta	Eocene	2160	180	claystone, shale
Wilcox Group	Eocene	2340	1920	shale, limestone
Midway Group	Eocene	4260	450	limestone, sandstone
Selma Group	Cretaceous	4710	1440	chalk
Eutaw	Cretaceous	6150	690	sand, sandstone, shale
Tuscaloosa Group	Cretaceous	6840		sand, gravel, shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Wilcox Group	Tallahatta
(2) Depth (Ft.)	3827 - 3947	2160 - 2340
(3) Thickness (Ft.)	120	180
(4) Formation Fluid Pressure, psi	0.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	approx. 0.82 psi/ft.	
(7) Age of Unit	Eocene	Eocene
(8) Porosity %	28%	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	67°C @ 7514	
(11) Character and Areal Distribution	sand, sandstone extensive	shale, limestone, marl extensive

C. Chemical Characteristics of Formation Fluids: saline chlorides 6.5%, Na 4%, sulfate 6%

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Miocene	0	550	extensive	sand, gravel	good
Alluvium	0	100	variable	sand, gravel	good

4. Mineral Resources in Area: Citronella, South Carlton and Tensaw Lake oil fields; limestone, lignite, salt

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: None

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): dilute hydrochloric acid and other organic and inorganic wastes including diazine, chlorobenzilate, and triazines volume 1000 gpm
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: None
   B. Conc. Dissolved Solids, mg/l: 35,446
   C. Specific Gravity: approx. 1.0
   D. Temperature: ambient
   E. pH: 7.4

(b)

3. **Toxicity:** Diazine fatal to humans - 0.4 mg/kg. chlorobenzilate (chlorinated hydrocarbon insecticide) - highly toxic

4. **Reactivity with Surface Equipment Components:** Possible corrosion in diluate HCl

5. **Degradability Level and Rate:** Chlorinated hydrocarbons highly resistant to degradation

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably none - material injected highly toxic and probably destroys all bacteria injected with wastes

7. **Pre-injection Waste Treatment:** Settling ponds, filtered to remove solids larger than 3 fl.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		65#	16"	1063
Intermediate		51#	10 3/4	3827
Injection		3.7# fiber glass	4 1/2"	
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** Cement plug from 4250 to 3935, 20" conductor cemented from 1063' to surface, long string cemented from 3827 to surface. Dow acid proof cement from 3628 to 3878'

3. **Well Head Equipment (Name and Models):** Injection press-gage, 4" Master Valve

4. **Packers, Centralizers, and Other Subsurface Equipment:** Liner hanger 3628

5. **Bottom Hole Completion:** 5 - 9/16" O.D. 180' schedule 40 "C" - 276 hastelloy screen liner, gravel pack 20" open hole plugged back to 3947'

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 5000 gals. HCl acid

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: 6 per strip chart for continuous records of injection pressure, annulus pressure, effluent pH, flow rate, specific gravity, interface monitor

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Surface Storage

3. Regulatory Aspects

A. Construction Requirements: All fresh water must be cased; all mineral resources protected.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: May not exceed fracture pressure

Well Id. Code: A1-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: Ciba-Geigy Inc.
McIntosh, Alabama

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 31°16'47"/87°59'44"
3. Well Location (Legal Description): Sec. 4.1, T4N, R1W
4. County: Washington State: Alabama
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Same as A1-4 well #1
Dilute hydrochloric acid with other inorganic and organic including diazines chlorobenzilate and triazines
2. Date Well Permitted: 6/71 Completed:
3. Injection Rate: 1000 gpm
4. Injection Pressure: N/A
5. Total Depth of Well: 2500
6. Name, Age, and Depth of Injection Zone: Wilcox Group, Eocene, 2340-4260
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Holding Ponds and Tombighee River

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Undifferentiated	Oligocene	1050	180	clay, sand, shale
Jackson Group	Eocene	1230	210	clay, sand, shale
Claiborne Group	Eocene	1440	720	clay, sand, shale
Tallahatta	Eocene	2160	180	claystone, shale
Wilcox Group	Eocene	2340	1920	shale, limestone

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Wilcox-Claiborne	Claiborne Group
(2) Depth (Ft.)	2000 - 2296	1760 - 1970
(3) Thickness (Ft.)	296	210
(4) Formation Fluid Pressure, psi	0.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	approx. 0.82 psi/ft.	
(7) Age of Unit	Eocene	Eocene
(8) Porosity %	32	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	38°C @ 1023'	
(11) Character and Areal Distribution	shale, limestone, sandstone, marl extensive	shale, limestone, marl extensive

C. Chemical Characteristics of Formation Fluids: Chloride 74,000 - 78,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Miocene	to 550	550	extensive	sand & gravel	good
Alluvium	0-100	0-100	variable	sand, silt,	good

4. Mineral Resources in Area: Citronella, South Carolton, and Tensaw Lake oil fields, limestone; lignite, salt

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: None

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Dilute HCl, inorganic and organic wastes including diazine, chlorobenzilate, and triazines

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: None
   B. Conc. Dissolved Solids, mg/l: 35,446
   C. Specific Gravity: Approx. 1.0
   D. Temperature: Ambient
   E. pH: 7.4

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3. **Toxicity:** Diazine fatal to humans - 0.4 mg/kg
Chlorobenzilate (chlorinated hydrocarbon insecticide) - highly toxic

4. **Reactivity with Surface Equipment Components:** Possible corrosion in dilute HCl

5. **Degradability Level and Rate:** Chlorinated hydrocarbons highly resistant to degradation

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably none-material injected highly toxic and probably destroys all bacteria injected with wastes.

7. **Pre-injection Waste Treatment:** Settling ponds, filters to 3 microns, biocide treatment

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17 1/2"	54.5 #/ft.	13-3/8	1017
Intermediate	12 1/4"	43.5 #/ft.	9-5/8	2000
Injection		23 #/ft.	7	1885
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 960 sacks of class H with 4% gel 500 sacks class H with 2% CaCl - 200 sacks class A with 3% CaCl - 600 sacks of Trinity tite wate 145 sack cement plug.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer set @ 1885

5. **Bottom Hole Completion:** 253 feet of 2.0 gavel screen and 154 feet of blank pipe was set from 1889 feet to 2296 and gravel packed in 17 inch hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized with 5000 gals of super mud acid

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: 5 pen strip chart for inj. pressure, casing-tubing annulus, effluent pH, flow rate, specific gravity

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Surface storage

3. Regulatory Aspects

A. Construction Requirements: All fresh water must be cased off; all mineral resources protected

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must not exceed fracture press

Well Id. Code: AR-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Great Lakes Chemical Corp.
P.O. Box 1878 - El Dorado, Arkansas 71730

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 33"11'792°42'10"
3. Well Location (Legal Description): 280 FWL 29FNL SE 1/4 NW1/4 SE1/4 Sec. 1, 18S 16W
4. County: Union State: Arkansas
5. SIC Classification: 2819

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: H_2SO_4
2. Date Well Permitted: 4/71 Completed:
3. Injection Rate: 1.42 mgy
4. Injection Pressure: 60 psi
5. Total Depth of Well: 2922
6. Name, Age, and Depth of Injection Zone: Lower Graves, Createaceous 2714 - 2769
7. Date Injection Began: (Day) (Month) (Year) 71
8. Total Volume Injected to Date: 4,680,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Retention in pond

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC AR-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Lower Graves	
(2) Depth (Ft.)	2714	
(3) Thickness (Ft.)	55	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Upper Cretaceous	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Continuous Sandstone	Shale

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Oil and gas

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: None

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sulfuric acid from methyl bromide acid scribber and methyl bromide tail acid

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.2
   D. Temperature: 80
   E. pH: .1

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3. **Toxicity:** Toxicity of H_2SO_4 arises from pH changes produced by the acid

4. **Reactivity with Surface Equipment Components:** Protective equipment used
No reaction with surface equipment

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:**
Probably not sterile at injection; bacterial activity minimal

7. **Pre-injection Waste Treatment:** Filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	322#/ft. H-40	9-5/8	1032
Intermediate				
Injection	8-1/2	155 + 17#/ft. J-55	5-1/2	2604
Other	8-1/2	5.5#/Ft. Fibercast	5-1/2	3010

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 400 sks
50/50 doz. 1100 sks neat. - 1032
1st stge - 2139 gal. HLx116
2nd stge - 470 sks Hall lt. with 3% salt - 3010

3. Well Head Equipment (Name and Models): Hinder Liter Head

4. Packers, Centralizers, and Other Subsurface Equipment: None

5. Bottom Hole Completion: Set thru Notch Fibercast Injection Zone

6. Hydraulic Fracturing, Acidizing Programs, etc.: 500 gal. HF Acid

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 1-500 gal. Fiberglass tank
1-1/2" Polypropylene lines

2. Filters: Cartridge

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3. Pumps: Centrifugal injection pump

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average	Variable	Maximum	30
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	12/31/72	Average	10	Maximum	10
"					
"					
"					

3. Annual Volume Injected, gal.
A. 1972 120,000,000 B. 1971 300,000,000 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Anode System on tubing

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Folding tanks

3. Regulatory Aspects

A. Construction Requirements: State has no formal requirements

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: CO-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP
Operating Company Name and Address: U.S. Corp of Engineers and Chemical Corp
Rocky Mountain Arsenal, Colorado

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): NW 1/4, NE 1/4, Sec 26, T2S, R67W
4. County: Adams State: Colorado
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical wastes.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 200 gpm
4. Injection Pressure: 550 psi
5. Total Depth of Well: 12,045 ft
6. Name, Age, and Depth of Injection Zone: PreCambrian, 11950 ft.
7. Date Injection Began: (Day) (Month) 11 (Year) 61
8. Total Volume Injected to Date: 165,000,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) 02 (Year) 66
10. Previous Mode of Disposal: Seepage ponds

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Fox Hill	Cretaceous	0	1,250	sandstone
Pierre	Cretaceous	1,250	4,198	shale
Hygiene	Cretaceous	5,448	2,262	sandstone
Niobrara	Cretaceous	7,710	290	shale
Benton	Cretaceous	8,000	345	shale, limestone
Muddy	Cretaceous	8,345	100	sandstone
Dakota	Cretaceous	8,445	300	sandstone
Lakota	Cretaceous	8,745	41	sandstone
Morrison	Jurassic	8,786	190	shale
Lykins	Triassic	8,976	610	sandstone
Fountain	Pennsylvanian	9,582	2,382	conglomerate
	Pre Cambrian	11,950		schist, gneiss

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	11,950	
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	4,653	
(6) Hydrofracturing Pressure, psi	.416 psi/ft est.	
(7) Age of Unit	PreCambrian	
(8) Porosity %	2	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	116°	
(11) Character and Areal Distribution	hornblende granite gneiss	

C. Chemical Characteristics of Formation Fluids: Brine at 114° C

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Fox Hills	0	1250	extensive	sandstone	good

4. Mineral Resources in Area: Oil is produced from the Dakota and Muddy in the Denver Basin.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Ammonia, nitrates, chlorides, chlorates, chlorinated hydrocarbons, and organic phosphorus compounds
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: 8.0

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Settling, filtration, and addition of bacteria killing agent.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20		20	
Intermediate	17-1/2		13-3/8	2,000
	11		8-5/8	11,171
Injection			5-1/2	9,000
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 20 inch casing - cement + 2% $CaCl_2$; 13-3/8 inch casing - 2020 sks Pozmix; 8-5/8 inch casing - 2550 sks 50-50 Pozmix; 5-1/2 inch casing - Pozmix + 6% Bentonite.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Baker model D packer at 9011 ft.; 2 centralizers on 8-5/8" casing at 4507 ft. and 9866 ft.

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 4 inch flow line, 90 acre asphalt lined lake, 12000 gal. concrete presedimentation tank, and 30000 gal clarifier.

2. Filters: 2 - US Filtre Co. leaf filter

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3. Pumps: 2 - single stage centrifugal lift pumps, 4 - Worthington positive displacement pumps to protect against water hammer.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Seismic monitoring from several locations.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: - N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: Seismic monitoring

C. Restrictions of Operation Procedures: N/A

Well Id. Code: CO-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: NOUP

Operating Company Name and Address: Shell Oil Company
1700 Broadway - Denver, Colorado

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): 250 ft. east and 110 ft. south of west 1/4 corner of Sec 28, T1S, R97W
4. County: Rio Blanco State: Colorado
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste water from an experimental pilot project.
2. Date Well Permitted: 12/1/70 Completed:
3. Injection Rate: 42 gpm
4. Injection Pressure: 350 psi
5. Total Depth of Well: 1500 ft.
6. Name, Age, and Depth of Injection Zone: Green River, Tertiary 1445 ft.
7. Date Injection Began: (Day) 01 (Month) 01 (Year) 71
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) 31 (Month) 12 (Year) 71
10. Previous Mode of Disposal: None

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Green River	Tertiary	120	2000	shale, siltstone

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Green River	Green River
(2) Depth (Ft.)	1445	
(3) Thickness (Ft.)	40	
(4) Formation Fluid Pressure, psi	580 at 1250 ft.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1566	
(7) Age of Unit	Tertiary	Tertiary
(8) Porosity %	30	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	30°	
(11) Character and Areal Distribution	leached zone	shales

C. Chemical Characteristics of Formation Fluids: TDS = 84,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Extensive petroleum deposits in the basin in the form of oil shale, sodium minerals such as Dawsonite and Nahcolite are found in the lower portion of the Green River.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste from an experimental oil shale pilot project - brine solution containing $NaCO_3$ and $NaHCO_3$ as principal salts.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: 150,000
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Settling of suspended solids and possible filtration and dilution if necessary

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4		9-5/8	182
Intermediate	8-3/4	20# K-55	7	1100
Injection	6	EUE tubing	3-1/2	1100
Other			5-1/2	

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Tension packer at 1900 ft.; Baker lock set packer at 1127 ft.; pressure gage is used on the well head.

5. Bottom Hole Completion: Open hole completion to 1240 ft. Slotted 5-1/2 inch casing at the bottom 50 ft. of hole.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 100 barrel surge tank and 7,500 barrel lined sump pit

2. Filters: N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	1/6/71	Average	42	Maximum	
"	2/1/71		42		63
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	1/6/71	Average	108	Maximum	
"	2/1/71		260		
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Rate of injection, volume, pump and casing pressure, and chemical character of waste recorded daily - Monthly reports to Water Pollution Control Commission.

B. Sampling Frequency and Water Quality Parameters Measured: Samples of wastes analyzed weekly; water quality of domestic well and nearby stream analyzed monthly.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Waste diverted to 15,000 barrel pit lined with impermeable membrane.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Total volume not to exceed 150 acre-feet; pump pressure not to exceed 350 psi.

Well Id. Code: CA-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: NOUP

Operating Company Name and Address: Aerojet-General Corporation
P.O. Box 1947 - Sacramento, California

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 11 (Year) 72
2. Latitude and Longitude: 38°37'25"/121°12'30"
3. Well Location (Legal Description): Sec. 32, T9N, R7E
4. County: Sacramento State: California
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Nitroplasticizer production waste
2. Date Well Permitted: 3/62 Completed:
3. Injection Rate: 5,000,000 gpy
4. Injection Pressure: Vacuum
5. Total Depth of Well: 1,564 ft.
6. Name, Age, and Depth of Injection Zone: Mehrten, Miocene-Piocene 1400
7. Date Injection Began: (Day) (Month) 01 (Year) 63
8. Total Volume Injected to Date: 10,095,480 1/66 to 7/68 (Gallons)
9. Date Injection Ceased: (Day) 11 (Month) 06 (Year) 68
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Victor	Quaternary			silts, sands, gravels
Laanna	Tertiary-quaternary			silts, sands, gravels
Mehrton	Miocene-Piocene		430	sandstone, siltstone,
	Createaceous			consolidated sedimentary
				and igneous rocks

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mehrton	
(2) Depth (Ft.)	1400	930
(3) Thickness (Ft.)	430	430
(4) Formation Fluid Pressure, psi	400 psi at 941 ft.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	0.8 psi/ft est.	
(7) Age of Unit	Miocene-Piocene	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	14°	
(11) Character and Areal Distribution	Sandstone, siltstone	Sandy siltstone
	Conglomerate, tuff-breccia	
	Exten.--greater than 5-10 miles	

C. Chemical Characteristics of Formation Fluids: Brackish-pH 8.0, about 300 ppm total chlorides and 800 ppm TDS

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Mehrton	300	240		sandstone, siltstone conglomerates, tuff-breccias	Principal usable acquifer

4. Mineral Resources in Area: Gold dredging has been done in this area

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: No wells noted other than shallow fresh water wells.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Nitroplasticer production waste

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 49,166
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 9.4

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3. **Toxicity:** Nitrite poisonous at high concentrations, accepted limit 2 mg/1, infant methemoglobinemia possible from high nitrate concentrations, accepted limit 50 mg/1 - sulfate limit 25 mg/1 for drining water

4. **Reactivity with Surface Equipment Components:** None

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection, bacterial activity minimal

7. **Pre-injection Waste Treatment:** Settling in a detention pond, filtration, pH adjustment, and addition of corrosion inhibitor

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Casing	18	72
Intermediate	17	45.45 # seamless black steel	12 3/4	970
Injection			8 5/8	1400
Other	17	Drilled hole		1564

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 12 3/4 inch casing - 356 sks - permanent Class A cement premixed with 356 c.f. perlite plus 4% bentonite gel + 58 sks neat cement; cement plug at 953 feet

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer set at 941 ft.; casing centralizers on 12 3/4 inch casing at 250, 300, 725, and 938 ft.; wall scratchers on bottom joint of 12 3/4 inch

5. **Bottom Hole Completion:** Open hole below 1400 8 5/8 inch casing perforated.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Detention pond

2. **Filters:** N/A

3. Pumps: Centrifugal pump with a maximum allowable well head injection pressure of 50 psig

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	1966	Average	vacuum	Maximum	24
"	1967		vacuum		22
"	1968		vacuum		14
"					

3. Annual Volume Injected, gal.
A. 1968 1,463,720 B. 1967 4,910,680 C. 1966 3,721,080

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous injection pressure and rate while in operation. At present there is no monitoring and well is inactive.

B. Sampling Frequency and Water Quality Parameters Measured: A yearly report of waste water injected was submitted, but no system of monitoring water quality is presently being conducted.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Well head pressure was monitored continuously but at present well is capped

2. Contingency Plan for Well Failure During Operation: None

3. Regulatory Aspects

A. Construction Requirements: Constructed according to State of California Department of Natural Resources, Division of Oil and Gas

B. Monitoring Requirements: Notify state of all significant changes while in operation

C. Restrictions of Operation Procedures: None

Well Id. Code: CA-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Fairchild Space and Defense Systems
Beale Air Force Base - Marysville, Calif.

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) (Month) (Year) 72
2. Latitude and Longitude: 39°05'30"/121°25'38"
3. Well Location (Legal Description): 2000 ft. North and 2260 feet east of SW Corner, Sec. 4, T14N, R5E
4. County: Yuba State: California
5. SIC Classification: 3861

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Developers, fix solutions, hardeners, bleaches, and wash waters from both color and black and white processes
2. Date Well Permitted: 10/15/65 Completed:
3. Injection Rate: 400,000 gpd
4. Injection Pressure: N/A
5. Total Depth of Well: 1070 plugged back from 1110
6. Name, Age, and Depth of Injection Zone: Wheatland, Eocene, 1010 - 1110
7. Date Injection Began: (Day) (Month) 06 (Year) 66
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Cenozoic	0	396	sand, gravel, silt, clay
	Cenozoic	396	550	sand, silt, clay
	Cenozoic	550	732	clay and clayey silt
		732	278	olive gray clay
Wheatland	Eocene	1100	100	sand

WIC CA-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Wheatland	Undifferentiated
(2) Depth (Ft.)	1010	400
(3) Thickness (Ft.)	100	700
(4) Formation Fluid Pressure, psi	.44 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Eocene	Cenozoic
(8) Porosity %	35	
(9) Permeability, millidarcies	100 - 5000	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Gray fine-grained silty sand in extent	Clays and silts

C. Chemical Characteristics of Formation Fluids: TDS 27664 mg/l, 14600 mg/l Cl., 8400 mg/l Na, 3000 mg/l sulfate, 1600 mg/l Ca, pH 7.6

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	306	90			fresh
	396	154			brackish
	550				saline

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: CA-3, CA-4 injection wells

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Photo processing wastes

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

WIC CA-2

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: System to remove silver from waste prior to injection

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/4	48# H-40R	13-3/8	205
Intermediate	12-1/4	32# H-40R	8-5/8	980
Injection		96.25# Long stainless steel	6-3/8	1066
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 190 sks to surface, 12-1/4 450 sks

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 8-5/8" packer set in the lower joint of the liner at 984; Type Baker Model AD tension packer set with 10,000 lb tension

5. Bottom Hole Completion: Liner-perforated, top at 979' bottom at 1070' 60 mesh perforations, 2" slots, 6" centers, gravel packed

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC CA-2

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: A ground water monitor well located 330 ft. N and 460 ft. W of SE corner, Sec. 5, T14N, R5E

C. Restrictions of Operation Procedures: None

Well Id. Code: CA-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Fairchild Space & Defense Systems
Beale AFB, Marysville, California

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 08 (Year) 72
2. Latitude and Longitude: 39°05'30"/121°25'38"
3. Well Location (Legal Description): 2000 ft. north and 2260 ft. east of SW corner, Sec. 4, T14N, R5E.
4. County: Yuba State: California
5. SIC Classification: 3861

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Developers, fix solutions, hardeners, bleaches, and wash waters from both color and black and white processes.
2. Date Well Permitted: Completed: 6/66
3. Injection Rate: 400,000 gpd
4. Injection Pressure: N/A
5. Total Depth of Well: 1196 Plugged back from 1304 ft.
6. Name, Age, and Depth of Injection Zone: Wheatland, Eocene, 1010-1110 ft.
7. Date Injection Began: (Day) (Month) 06 (Year) 66
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Cenozoic	0	396	sand, gravel, clay
	Cenozoic	396	154	sand, silt, clay
	Cenozoic	550	182	clay, silt
	Cenozoic	732	278	clay
Wheatland	Eocene	1010	100	sand

WIC CA-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Wheatland	Undifferentiated
(2) Depth (Ft.)	1010	400
(3) Thickness (Ft.)	100	610
(4) Formation Fluid Pressure, psi	0.44 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Eocene	Cenozoic
(8) Porosity %	35	
(9) Permeability, millidarcies	100-5000	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	gray fine-grained silty sand	clay and silt

C. Chemical Characteristics of Formation Fluids: TDS 27664 mg/l, Cl 14600 mg/l, Na 8400 mg/l, sulfate 3000 mg/l, Ca 1600 mg/l, pH 7.6

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	306	90			fresh
	396	154			brackish
	550				saline

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Injection wells CA-2 and CA-4

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Photo processing wastes.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

WIC CA-3

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: System to remove silver from waste prior to injection.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17 1/2	48# H-40R-3	13 3/8	207
Intermediate	12 1/4	32# H-40R-3	8 5/8	1096
Injection				
Other	Liner	100.31 ft. long ss	6 5/8	1191

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13 5/8" - 160 sks, 8 5/8 - 530 sks

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC CA-3

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

   A. Monitoring Devices and Data:

   B. Sampling Frequency and Water Quality Parameters Measured:

   C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

   A. Construction Requirements:

   B. Monitoring Requirements:

   C. Restrictions of Operation Procedures:

Well Id. Code: [illegible]

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Fairchild Space & Defense Systems
Beale Air Force Base, Marysville, Calif.

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) (Month) (Year) 72
2. Latitude and Longitude: 39°03'30" / 121°23'38"
3. Well Location (Legal Description): 2000 ft. north and 2260 feet east of SW corner, Sec. 4, T14N, R5E
4. County: Yuba State: California
5. SIC Classification: 3861

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: developers, fix solutions, hardeners, bleaches and wash waters from both color and black and white processes
2. Date Well Permitted: Completed: 6/66
3. Injection Rate: 400,000 gpd
4. Injection Pressure: N/A
5. Total Depth of Well: 1213 plugged back from 1289
6. Name, Age, and Depth of Injection Zone: Wheatland, Cenozoic
7. Date Injection Began: (Day) (Month) 06 (Year) 66
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Cenozoic	0	396	sand, gravel, silt, clay
	Cenozoic	396	550	sand, silt, clay
	Cenozoic	550	732	clay and clayey silt
		732	278	olive gray clay
Wheatland	Eocene	1100	100	sand

(a)

WIC___ CA-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Wheatland	Undifferentiated
(2) Depth (Ft.)	1100	400
(3) Thickness (Ft.)	.44/ ft. est	
(4) Formation Fluid Pressure, psi	1.0/ft. est	
(5) Lithostatic Pressure, psi	1.0/ft. est	
(6) Hydrofracturing Pressure, psi	Eocene	Cenozoic
(7) Age of Unit	35	
(8) Porosity %	100-5000	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	gray fine-grained silty sand	silt and clay

C. Chemical Characteristics of Formation Fluids: TDS 27664 mg/1 14600 mg/1 Cl. 8400 mg/1 Na 3000 mg/1 sulfate. 1600 mg/1 Ca. pH 7.6

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	306	90			fresh
	396	150			brackish
	550				brine

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Areas injection wells CA-2 and CA-3

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Photo processing wastes

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC CA-4

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: elaborate system to remove silver from waste prior to injection

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2		13-3/8	212
Intermediate	12-1/4		8-5/8	1095
Injection				
Other	Liner	108.42 ft long	6-5/8	1203

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Liner (bottom to top) 20' perforated 10' semiperforated, 10' blank, 60' perforated, 5' blank, 1' perforated, 5' blank gravel pack-58 cu ft

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: CA-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: E.I. DuPont de Nemours and Company
P.O. Box 310 - Antioch, California

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 02 (Month) 11 (Year) 72
2. Latitude and Longitude: 38°00'30"/121°44'40"
3. Well Location (Legal Description): N/A
4. County: Contra Costa State: California
5. SIC Classification: 3332

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Comprised mostly of hydrocarbons which are gaseous at surface conditions and partially liquified at well formation conditions.
2. Date Well Permitted: 1/10/69 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 6800 ft.
6. Name, Age, and Depth of Injection Zone: Upper Meganos Sand, Paleocene 6100 - 6325 ft.
7. Date Injection Began: (Day) 10 (Month) 01 (Year) 69
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Domegine	Eocene	4390	220	sand
	Eocene	4610	110	shale
Capay	Eocene	4720	150	sand
	Eocene	4870	980	shale
Upper Meganos	Paleocene	5950	375	sand
	Paleocene	6325	165	shale
Lower Meganos	Paleocene	6490	150	sand

WIC CA-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Upper Meganos Sand	Shale
(2) Depth (Ft.)	6490	6325
(3) Thickness (Ft.)	150	165
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Paleocene	Paleocene
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	63°	
(11) Character and Areal Distribution	Sand	Shale

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: none

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Rio Vista Gas Field-Hamilton, Domengine, Oakley Gas Fields Dutch Slough Gas Field

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): hydrocarbons including ethane, ethylene, britane

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

WIC C 5

3. Toxicity: Possible contamination of ground water by hydrocarbons making its ingestion unpleasant, toxicity data unavailable.

4. Reactivity with Surface Equipment Components: none

5. Degradability Level and Rate: Possible oxidation of some of the hydrocarbons under pressure

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection, aerobic bacterial activity possible using O_2 and hydrocarbons

7. Pre-injection Waste Treatment: none

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Conductor casing	20	50
Intermediate			10 3/4	700
Injection		23#/ft	7	4240
Other		29#/ft	7	6800

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: casing perforated 6480-6650 ft

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC CA-5

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: FL-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Monsanto Textiles Company
P.O. Box 1507 Pensacola, Florida 32502

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) (Month) 01 (Year) 72
2. Latitude and Longitude: 30°35'32"/87°14'58"
3. Well Location (Legal Description): N/A
4. County: Escambia State: Florida
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Aqueous solution containing nitric acid, inorganic salts, and numerous organic compounds
2. Date Well Permitted: 2/63 Completed:
3. Injection Rate: 657 mgy
4. Injection Pressure: 180 psi
5. Total Depth of Well: 1808'
6. Name, Age, and Depth of Injection Zone: Florida, Tertiary, 1360-1730 ft.
7. Date Injection Began: (Day) 24 (Month) 07 (Year) 73
8. Total Volume Injected to Date: 4,000,000,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Bio-oxidation system

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Pensacola	Miocene	448	485	clay
Upper limestone	Oligocene	933	218	limestone
Bacatunna	Oligocene	1151	219	clay
Lower limestone	Oligocene	1360	359	limestone

WIC FL-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Florida	Bucatunna clay
(2) Depth (Ft.)	1360	1251
(3) Thickness (Ft.)	359	219
(4) Formation Fluid Pressure, psi	18	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Tertiary	Tertiary
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	37°	
(11) Character and Areal Distribution	Nearly pure limestone 97% $CaCO_3$ with wide areal distribution	clay, extensive

C. Chemical Characteristics of Formation Fluids: 7900 mg/l of chloride, 1 mg/l of hydrogen sulfide, ammonic-nitrogen, organic carbon, several mg/l of boron and a small amounttof organic nitrogen

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	448	Extensive	sand, gravel	fresh
Floridan:					
Upper limestone	1149	218	Extensive	limestone	Brackish Cl=350-450mg.
Lower limestone	1729	359	Extensive	quartz, sandy limestone, clay beds	Brackish Cl=5800-10,000

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: 1.9 mi. North of injection site and 1.5 miles south, 1523 ft. and 1430 ft. respectively; one shallow well 100 ft. from well "A" was drilled, 1140 ft.; deep monitor well 1300 ft., south of well "A" drilled 1650 ft. down. F-2

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Aqueous solution of organic monobasic and dibasic acids, nitric acid, sodium and ammonium salts, hexamethylene-alcohols, and esters
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 3.41
   D. Temperature: 25°C
   E. pH: 2.9

WIC FL-1

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Surface equipment, all stainless steel - no reactivity

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: 3-50 colonies per cubic centimeter

7. Pre-injection Waste Treatment: Originally pH raised to about 5.5 with aqueous ammonia. After April 1968 additional organic acids and nitric acid were added to produce a pH 2.3. Effluent of process is aged to allow precipitation in final waste pool.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	30"	API5L 5/16	24"	87'
Intermediate	24"	API5L 0.375	18"	982'
	17 5/8"	API5L 0.375	12 3/4"	872 - 1370'
Injection		304SS Sch. 5	8"	1370 - 1390'
Other		304SS Sch.40	6"	1380'

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: Surface casing - 250 bags Portland cement. Intermediate casing - 1260 bags Portland cement. Final casing - 360 bags Portland cement. No additives.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: A teflon packer was installed, but failed to seal. It was re-installed. A corrosion inhibiting water is kept circulating in the casing-tubing annulus. Brown Tool Co., Type D liner hanger 8" 304S/S

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: All wastes mixed in a holding basin--minimum 4 day capability - Maximum 10 days

2. Filters: None

3. **Pumps:** Horizontal two-stage centrifugal constructed of 304 stainless steel and driven by a 350 hp electric motor. Pump capacity 1200 gpm at 400 psi.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
July 1963		
" July 1964	1100	
" July 1969	1075	
" July 1971	1050	

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
July 1963		
" July 1964	217	
" July 1969	182	
" July 1971	162	

3. Annual Volume Injected, gal.
A. 1972 650,000,000 B. 1971 570,000,000 C. 1970 517,000,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure gages measure the annular space pressure at all wells continuously

B. Sampling Frequency and Water Quality Parameters Measured: Specific quality control of the waste tested daily; total quality determinations are made monthly. Monitoring well water quality tested monthly

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuously

2. Contingency Plan for Well Failure During Operation: Approx. 10-day lagoon

3. Regulatory Aspects

A. Construction Requirements: All construction approved by USGS and State regulatory agencies.

B. Monitoring Requirements: In accordance with State of Florida requirements

C. Restrictions of Operation Procedures: By mutual agreement with State regulatory agencies.

Well Id. Code: FL-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Monsanto Textiles Company
P.O. Box 1507 - Pensacola, Florida 32502

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 08 (Year) 72
2. Latitude and Longitude: 30°35'28"/87°15'06"
3. Well Location (Legal Description): N/A
4. County: Escambia State: Florida
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Aqueous solution containing nitric acid, inorganic salts, and numerous organic compounds
2. Date Well Permitted: 8/64 Completed:
3. Injection Rate: 657,000,000 gpy
4. Injection Pressure: 180 psi
5. Total Depth of Well: 1654 ft.
6. Name, Age, and Depth of Injection Zone: Florida, Tertiary, 1360-1730 ft.
7. Date Injection Began: (Day) (Month) 07 (Year) 65
8. Total Volume Injected to Date: 4,000 million (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Bio-oxidation system

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Recent	0	448	sand, gravel
Pensacola	Miocene	448	485	clay
Upper limestone	Oligocene	933	218	limestone
Bacatunna	Oligocene	1151	219	clay
Lower limestone	Oligocene	1360	359	limestone

(a)

WIC FL-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Florida	Bucatunna
(2) Depth (Ft.)	1360	1251
(3) Thickness (Ft.)	359	219
(4) Formation Fluid Pressure, psi	18	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Tertiary	Tertiary
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	37°	
(11) Character and Areal Distribution	nearly pure limestone 97% $CaCO_3$ with wide areal distribution	clay, extensive

C. Chemical Characteristics of Formation Fluids: 7900 mg/l Chloride, 1 mg/l hydrogen sulfide, ammonic-nitrogen, organic carbon, boron organic nitrogen

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	448	exten.	sand, gravel	fresh
Floridon:					
Upper limestone	1149	218	exten.	limestone	Cl=350-450 mg/l
Lower limestone	1779	359	exten.	quartz, sandy limestone, clay beds	Cl=5800-10000 mg/l

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Injection well F-1

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Aqueous solution of organic monobasic and dibasic acids, nitric acid, sodium and ammonium salts, adipenitrile, hexamethylenediamine, alcohols, keystones, and esters
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: 25°C
   E. pH: 2.9

WIC FL-2

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Surface equipment, all stainless steel - no reactivity

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** 3-50 colonies per cubic centimeter

7. **Pre-injection Waste Treatment:** Originally pH raised to about 5.5 with aqueous ammonia-after 1963 additional organic acids and nitric acid were added to produce a pH of 2.3 - effluent of process is aged to allow precipitation in final waste pond.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	22"	API5L 5/16	16"	0 - 110'
Intermediate	16"	API5L 0.375	10"	0 - 1394'
	16"	304SS Sch. 5	10"	1374 - 1415'
Injection		304SS Sch. 40	6"	0 - 1405'
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** Surface casing - 146 bags Portland cement - Final casing - 900 bags Portland cement.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Brown Tool Co. 6 5/8" Type D liner hanger 304 SS with Teflon seal.

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** All wastes in a holding basin-minimum holding capacity 4 day capacity - maximum holding capacity - 10 days

2. **Filters:** None

WIC FL-2

3. **Pumps:** Horizontal two-stage centrifugal construction of 304 stainless steel and driven by a 350 hp electric motor. Pump capacity 1200 gpm at 400 psi.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)		Average	Maximum
Date(s)	1965		
"	1966		
"	1969	1075	
"	1971	1050	

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)		Average	Maximum
Date(s)	1965	182	
"	1966	170	
"	1969	182	
"	1971	170	

3. **Annual Volume Injected, gal.**
A. 1972 650,500,000 B. 1971 570,000,000 C. 1970 510,000,000

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Pressure gages measure the annular pressure continuously

B. **Sampling Frequency and Water Quality Parameters Measured:** Specific quality measured daily, total quality monthly. Monitor well water tested monthly.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Continuously

2. **Contingency Plan for Well Failure During Operation:** 10 day lagoon

3. **Regulatory Aspects**

A. **Construction Requirements:** All construction approved by USGS and State regulatory agencies.

B. **Monitoring Requirements:** In accordance with Florida requirements.

C. **Restrictions of Operation Procedures:**

Well Id. Code: FL-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Quaker Oats Co., Belle Glade Chemical Plant
Belle Glade, Florida

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 08 (Year) 72
2. Latitude and Longitude: 26°42'10"/80°39'00"
3. Well Location (Legal Description): Sec. 28, T43S, R37E
4. County: Palm Beach State: Florida
5. SIC Classification: 2062

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: 1% solution of acetic acid with minor amounts of waxes and bagasse fibers (200,000 gpd from the sugar plant and 800,000 gpd from the furfural plant.)
2. Date Well Permitted: 12/10/65 Completed:
3. Injection Rate: 1,000,000 gpy
4. Injection Pressure: 50 psi
5. Total Depth of Well: 2242 ft.
6. Name, Age, and Depth of Injection Zone: Lower Floridian, Eocene, 1940 ft.
7. Date Injection Began: (Day) (Month) 12 (Year) 66
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit		Confining Bed
(1) Name	Lake City	Lower Floridian	
(2) Depth (Ft.)	1496	1940	200
(3) Thickness (Ft.)	444	300	1300
(4) Formation Fluid Pressure, psi			
(5) Lithostatic Pressure, psi	1.0 psi/ft est.		
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.		
(7) Age of Unit	M. Eocene-Oligocene		Tertiary
(8) Porosity %	very		
(9) Permeability, millidarcies	very		
(10) Reservoir Temperature, °C	29		
(11) Character and Areal Distribution	extensive dolomite		limestone, clay, sand

C. Chemical Characteristics of Formation Fluids: Chloride 2000 - 7000 mg/l

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Biscayne	200	200	wide	sand, clay	fresh
Upper Floridian	1105	60	wide	limestone	160 mg/l chloride
Lake City	1940	444	wide	dolomite	600-1300 mg/l chloride
Lower Floridian	2240	300	wide	limestone	2000-10000 mg/l Cl

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Two monitor wells. Deep monitor well 1000 ft. SE of injection well No. 1; shallow well drilled 100 ft. from injection well site.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Stripping column effluent, which is essentially a dilute acetic acid solution containing minor amounts of other dissolved organic chemicals and insoluable fibers.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 500 - 2800
   B. Conc. Dissolved Solids, mg/l: 3,000 - 17,000
   C. Specific Gravity: 1.0
   D. Temperature: 160° - 218° F
   E. pH: 2.6 - 4.5

WIC FL-3

3. **Toxicity:** Minimum detectable H_2S to taste in drinking water is 0.05 mg/l.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Filtration of sugar house waste water.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Black steel	20	228
Intermediate		Black steel	16	684
		Black steel	12	628-1480
Injection		SS316 ELC liner	12	1480-1492
Other		open hole	8	2242

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 16" - neat cement ASTM type II 400 sks; 12" - krete G-8 (acid-proof mortar) 820 sks from 1500 - 1938 ft.; 20" - 300 sks Type I

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** SS-304 liner hanger and teflon seal (1481 ft) Inhibitors used in annular space above seal.

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Surge tank for holding of waste water after screening.

2. **Filters:** 500 micron screen for removal of large suspended particles in sugar house waste water.

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Jan. 1972	Average	675	Maximum	
"	June 1971		438		
"	Nov. 1969		353		
"	Dec. 1967		144		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Jan. 1972	Average	54.1	Maximum	
"	June 1971		38		
"	Nov. 1969		50		
"	Dec. 1967		35		

3. Annual Volume Injected, gal.
A. 19 72 67,170,000 B. 19 71 147,800,000 C. 19 70 203,240,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous recording of well temperature, flow, pressure, casing pressure.

B. Sampling Frequency and Water Quality Parameters Measured: Daily - pH, conductivity, Weekly - COD, specific gravity. Bi-weekly - BOD, suspended solids.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Will use monitor well for injection

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: FL-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: NOUP

Operating Company Name and Address: Quaker Oats Co., Belle Glade Chemical Plant
Belle Glade, Florida

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 08 (Year) 72
2. Latitude and Longitude: 26°42'10"/80°39'00"
3. Well Location (Legal Description): Sec. 28, T46S, R37E
4. County: Palm Beach State: Florida
5. SIC Classification: 2062

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: 1% solution of acetic acid with minor amounts of waxes and begasse fibers.
2. Date Well Permitted: 66 Completed:
3. Injection Rate: 64,000,000 gpy
4. Injection Pressure: 51.3 psi
5. Total Depth of Well: 2067 ft.
6. Name, Age, and Depth of Injection Zone: Lower Floridian, Oligocene, 1940-2240 ft.
7. Date Injection Began: (Day) 08 (Month) 10 (Year) 71
8. Total Volume Injected to Date: 75,863,000 (12/72) (Gallons)
9. Date Injection Ceased: (Day) 12 (Month) 01 (Year) 72
10. Previous Mode of Disposal: Well number 1 (this well was a monitor well prior to injection.)

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC FL-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Lower Floridian	
(2) Depth (Ft.)	1940	200
(3) Thickness (Ft.)	300	1300
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Oligocene	Tertiary
(8) Porosity %	very	
(9) Permeability, millidarcies	very	
(10) Reservoir Temperature, °C	29°	
(11) Character and Areal Distribution	very extensive dolomite	limestone, clay, sand - extensive

C. Chemical Characteristics of Formation Fluids: Chloride content 1000 - 7000 mg/l

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Biscayne	200	200	wide	sand, clay	fresh
Upper Floridian	1105	60	wide	limestone	1160 mg/l Cl⁻
Lake City	1940	444	wide	dolomite	600-1300 mg/l Cl⁻
Lower Floridian	2240	300	wide	limestone	2000-10,000 mg/l Cl⁻

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Monitor well and injection well

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Used during failure of FL-3

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

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3. Toxicity: Minimal detectable H_2S to taste in drinking water is 0.05 mg/l.

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Screening and filtration of sugar house waste water.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Black Steel	20	240
Intermediate		Black Steel	16	848
		Black Steel	12	1474
Injection		SS316 ELC	12	1474-1840
Other			9	1840-2067

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Surge tank for holding of waste water after screening.

2. Filters: 500 micron screen for removal of large suspended particles in sugar house waste water.

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Jan. 1972	Average	700	Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Jan. 1972	Average	55	Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19 72 11,669,000 B. 19 71 64,194,000 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous recording of well temperature, flow, pressure, and casing pressure.

B. Sampling Frequency and Water Quality Parameters Measured: Daily - pH, conductivity; Weekly - COD, specific gravity; Bi-weekly - BOD, suspended solids.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: FL-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND
Operating Company Name and Address: Kaiser Aluminum and Chemical Corp.
P.O. Box 646, Mulberry, Florida

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 08 (Year) 72
2. Latitude and Longitude: 27°54'18"/81°59'08"
3. Well Location (Legal Description): Sec. 3, T30S, R23E
4. County: Polk State: Florida
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Major raw materials are fluosilicic acid and sodium chloride. Minor amounts of sodium carbonate, a non-biodegradable wetting agent and boiler water treatment chemicals.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 210,000,000 gpy
4. Injection Pressure: N/A
5. Total Depth of Well: 6000 ft.
6. Name, Age, and Depth of Injection Zone: Lawson, Paleocene 4000-6000' ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: 30 acre holding lake on plant property where it overflows into a nearby stream.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Bone Valley-Hawthorne	Miocene	0	175	phosphate, limestone
Tampa-Suwanee	Oligocene	175	150	limestone
Ocala	Eocene	325	220	limestone, dolomite
Avon Park	Eocene	545	830	limestone, dolomite
Lake City	Eocene	1375	610	limestone
Oldsmar	Eocene	1985	700	limestone, gypsum
Cedar Keys	Paleocene	2685	1170	anhydrite, dolomite
Lawson	Paleocene	4495	770	dolomite
Taylor	Cretaceous	5275	725	limestone

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Lawson	Cedar Keys
(2) Depth (Ft.)	4495	2685
(3) Thickness (Ft.)	770	1170
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Paleocene	Paleocene
(8) Porosity %	26.5	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite	anhydrite, dolomite

C. Chemical Characteristics of Formation Fluids: 11.5% total salt and 7% Cl^-

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Suwanee				limestone	fresh
Ocala	325	220	extensive	limestone	fresh
Avon Park	545	830	extensive	dolomite	fresh
Lake City	1375	610	extensive	limestone	bitter

4. Mineral Resources in Area: Phosphates

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Industrial waste, non-degradable inorganic chemicals only, 6.5% chlorides, 0.3% fluorides.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 9000
   B. Conc. Dissolved Solids, mg/l: 55000
   C. Specific Gravity: N/A
   D. Temperature: ambient
   E. pH: 1.0

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3. Toxicity: Chlorides in domestic water supply should be limited to 250 mg/l.

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 62' x 15' x 9' lined concrete collection pit; 40,000 gal. lined pump tank for injection.

2. Filters: N/A

WIC FL-5

3. Pumps: Two alloy pumps capable of injecting total flow of 500 gpm.

VII: OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	estimated	Average	400	Maximum	500
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Waste flow monitor, annulus pressure alarm; conductivity alarm and pressure alarm in monitoring wells.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: 350' x 600' emergency storage pond - shut plant down.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: FL-6

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND

Operating Company Name and Address: Kaiser Aluminum and Chemical Corp.
P.O. Box 646, Mulberry, Florida

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 08 (Year) 72
2. Latitude and Longitude: 27°54'18"/81°59'38"
3. Well Location (Legal Description): N/A
4. County: Polk State: Florida
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Fluosilicic acid and sodium chloride
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

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3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps: ____

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	____	Average	____	Maximum	____
"	____		____		____
"	____		____		____
"	____		____		____

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	____	Average	____	Maximum	____
"	____		____		____
"	____		____		____
"	____		____		____

3. Annual Volume Injected, gal.
A. 19__ ____ B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____

B. Sampling Frequency and Water Quality Parameters Measured: ____

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____

2. Contingency Plan for Well Failure During Operation: ____

3. Regulatory Aspects

A. Construction Requirements: ____

B. Monitoring Requirements: ____

C. Restrictions of Operation Procedures: ____

Well Id. Code: FL-7

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND
Operating Company Name and Address: American Cyanamid Co., Santa Rosa Plant
Milton, Florida

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 08 (Year) 72
2. Latitude and Longitude: 30°34'05"/87°06'46"
3. Well Location (Legal Description): American Cyanamid Test Well No. 1; Sec. 35, T1S, R29W
4. County: Santa Rosa State: Florida
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Lower Floridian
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Lower Floridian	Bucatunna
(2) Depth (Ft.)	1320	1117
(3) Thickness (Ft.)	226	203
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Eocene	Oligocene
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	35°	33°
(11) Character and Areal Distribution	Limestone extensive	Clay extensive

C. Chemical Characteristics of Formation Fluids: TDS - 11,760-14,400 mg/l

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Sand and gravel	0	434	extensive	sand	potable
Upper Floridian	1117	256	extensive	limestone	potable
Lower Floridian	1546	226	extensive	limestone	saline

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: The Monsanto Company wells penetrating the lower Floridian aquifer about 8 miles northwest of the test site.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection:
N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	24	Black Steel 0.375" AWWA	18	100
Intermediate		A100-58 and ASTMA - 53B		
	17	As Above	12	881
Injection	12	Black Steel	6	1461
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:
ASTM type II neat cement.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Centralizers only at 20' above bottom, 40' above bottom, and 100' above bottom; Haliburton Model S-3

5. Bottom Hole Completion: Open hole from 1461' - 1547'

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous pressure recorder.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: FL 8

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN
Operating Company Name and Address: Kendale Lake Wastewater Treatment Plant

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 03 (Year) 72
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 3, T25S, R4E, Tallahassee M
4. County: N/A State: Florida
5. SIC Classification: 4952

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Municipal waste treatment plant effluent
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 4,250,000 gpy
4. Injection Pressure: N/A
5. Total Depth of Well: 3280 ft.
6. Name, Age, and Depth of Injection Zone: Lake City and Cavernous, Eocene, 2500 ft
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Biscayne	Pleistocene	0	140	shell rock
Hawthorne	Miocene	140	260	limestone
Tampa	Miocene	400	480	limestone
Suwanee	Oligocene	880	200	limestone
Avon Park	Eocene	1080	660	limestone
Lake City	Eocene	1740	1120	limestone, dolomite
Oldsmar	Eocene	2860	100	sandstone, dolomite
Cavernous	Eocene	2960		limestone

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Lake City Cavernous	
(2) Depth (Ft.)	2500	100
(3) Thickness (Ft.)	800	2400
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Eocene	Eocene
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone extensive	limestone extensive

C. Chemical Characteristics of Formation Fluids: Chloride 1800-3725 mg/1

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Municipal waste effluent at 20 ppm BOD

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ____________ Average ____________ Maximum ____________
" ____________ ____________ ____________
" ____________ ____________ ____________
" ____________ ____________ ____________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ____________ Average ____________ Maximum ____________
" ____________ ____________ ____________
" ____________ ____________ ____________
" ____________ ____________ ____________

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________

2. Contingency Plan for Well Failure During Operation: ____________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: FL-9

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Sunset Park Wastewater Treatment Plant
SW 93rd St., Miami, Florida

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 08 (Year) 72
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Dade State: Florida
5. SIC Classification: 4952

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Municipal sewage plant with a solids contact stabilization type design.
2. Date Well Permitted: 7/8/71 Completed:
3. Injection Rate: 2,500,000 gpd
4. Injection Pressure: 44 psi
5. Total Depth of Well: 2947 ft.
6. Name, Age, and Depth of Injection Zone: Lake City and Oldsmar, Eocene 1810 ft.
7. Date Injection Began: (Day) 05 (Month) 07 (Year) 1971
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Disposal into adjacent Snapper Creek Canal

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Biscayne	Pleistocene	0	120	limestone
Hawthorne	Miocene	120	280	limestone
Tampa	Miocene	400	490	limestone
Suwanee	Oligocene	890	180	limestone
Avon Park	Eocene	1070	650	limestone
Lake City - Oldsmar	Eocene	1720	1220	limestone

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Lake City-Oldsmar	Avon Park
(2) Depth (Ft.)	1810	1070
(3) Thickness (Ft.)	1137	650
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Eocene	Eocene
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	22°	
(11) Character and Areal Distribution	carbonates	limestone

C. Chemical Characteristics of Formation Fluids: Chloride 18,000 - 19,000 mg/l

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Biscayne	0	100		limestone	fresh
	900	600		limestone	brackish
Floridian	1600	800		limestone	brackish

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: City of Miami ORR well field 2 mi NE

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Domestic waste with 90% organic load reduction.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: 315
   - C. Specific Gravity: N/A
   - D. Temperature: 27°C
   - E. pH: 7.0

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: Biodegradable organics still present especially for anaerobic biodegradability.

6. Biological Level at Injection and Estimated Biological Level After Injection: 0-5 mg/l chlorine residual continuous inhibitor used to reduce biodegradability.

7. Pre-injection Waste Treatment: Solids - contact - stabilization treatment

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) 7/5/71	Average 1625	Maximum
" 6/26/71	2083	
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) N/A	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19 72 467,550,000 B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Annulus monitor

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Pump to Snapper Creek Canal

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: HI-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR
Operational Status: 0
Operating Company Name and Address: City and County of Honolulu
Division of Sewers - City Hall, Honolulu

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 05 (Month) 11 (Year) 72
2. Latitude and Longitude: 21°21'31"/157°42'23"
3. Well Location (Legal Description): N/A
4. County: Honolulu State: Hawaii
5. SIC Classification: 4952

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Secondary treated municipal treatment plan effluent.
2. Date Well Permitted: 5/68 Completed:
3. Injection Rate: N/A
4. Injection Pressure: Gravity
5. Total Depth of Well: 210
6. Name, Age, and Depth of Injection Zone: limestone, 73
7. Date Injection Began: (Day) 19 (Month) 05 (Year) 72
8. Total Volume Injected to Date: Unavailable (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Recent	0	19	clay, sand, coral,
	Recent	19	54	clay
	Recent	73	64	dune limestone
	Recent	136	83	reef and associated limst.
	Recent	219	24	basaltic beach rock
	Recent	243	24	limestone
	Recent	267	80	calcareous clay

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	73	19
(3) Thickness (Ft.)	146	54
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Recent	Recent
(8) Porosity %		
(9) Permeability, millidarcies	High	
(10) Reservoir Temperature, °C	24°	
(11) Character and Areal Distribution	Reef and associated limestone, dune limestone and calcareous beach rock	clay

C. Chemical Characteristics of Formation Fluids: 18,000 to 21,000 ppm chlorides, 34,000 to 38,000 ppm TDS.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
None					

4. Mineral Resources in Area: Surface limestone quarried in local

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: No water wells located or usable water resources located in immediate area

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Treated municipal sewage 18 mg/l BOD

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** Possible contamination of water from dissolved organics, heavy metals, pesticides and other components of the effluent.

4. **Reactivity with Surface Equipment Components:** None

5. **Degradability Level and Rate:** Possible breakdown of dissolved organics under pressure

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Not sterile at injection, bacterial breakdown of dissolved organics may occur

7. **Pre-injection Waste Treatment:** Secondary treatment and chlorination

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Casing	24	90
Intermediate				
Injection		PVC Plastic Pipe	15	120
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 4-inch annulus filled with cement - 15-inch casing to 24-inch casing filled with cement

3. **Well Head Equipment (Name and Models):** Sump tank

4. **Packers, Centralizers, and Other Subsurface Equipment:** PVC shoe @ 90 ft.

5. **Bottom Hole Completion:** Open hole - 90 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Sump located directly over well hole (6' x 10')

2. **Filters:** None

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3. **Pumps:** Gravity flow - none

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) 1972	Average Gravity	Maximum Gravity
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Injection water levels in two standby wells (alarm); continuous monitoring of injection flow

B. Sampling Frequency and Water Quality Parameters Measured: No chemical water quality plan

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Continuous

2. Contingency Plan for Well Failure During Operation: Two standby wells

3. Regulatory Aspects

A. Construction Requirements: Designed and constructed by State of Hawaii

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: None

Well Id. Code: HI-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR
Operational Status: DN
Operating Company Name and Address: City and County of Honolulu
Division of Sewers - City Hall, Honolulu

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 05 (Month) 11 (Year) 72
2. Latitude and Longitude: 21°20'28"/157°42'27"
3. Well Location (Legal Description): N/A
4. County: Honolulu State: Hawaii
5. SIC Classification: 4952

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Secondary treated sewage
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: Gravity
5. Total Depth of Well: 211
6. Name, Age, and Depth of Injection Zone: Limestone, 73
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: None - Standby for H-1 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Recent	0	19	clay, sand, coral
	Recent	19	54	clay
	Recent	73	64	dune limestone
	Recent	136	83	reef and associated limst.
	Recent	219	24	basaltic beach rock
	Recent	243	24	limestone
	Recent	267	80	calcareous clay

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	73	19
(3) Thickness (Ft.)	146	54
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Recent	Recent
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	24°	
(11) Character and Areal Distribution	Reef and associated limestone	clay

C. Chemical Characteristics of Formation Fluids: 18,000 - 21,000 ppm chlorides; 34,000 - 38,000 TDS

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
None					

4. Mineral Resources in Area: Limestone quarried

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: None

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Treated municipal sewage

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: Possible contamination of water from dissolved organics, heavy metals, pesticides and other components of the wastes.

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: Possible breakdown of dissolved organics under pressure

6. Biological Level at Injection and Estimated Biological Level After Injection: Not sterile at injection, bacterial breakdown of dissolved organics may occur.

7. Pre-injection Waste Treatment: Secondary treatment and chlorination

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Casing	24	90
Intermediate				
Injection				
Other		PVC Plastic Pipe (schedule 40)	15	80

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 4-inch annulus filled with cement - 15-inch casing to 24-inch casing filled with cement.

3. Well Head Equipment (Name and Models): Sump tank

4. Packers, Centralizers, and Other Subsurface Equipment: PVC shoe at 90 ft.

5. Bottom Hole Completion: Open hole section - 131 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Sump located directly over well hole

2. Filters: None

WIC HI-2

3. Pumps: Gravity flow

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: HI-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: City and County of Honolulu
Division of Sewers - City Hall, Honolulu

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 05 (Month) 11 (Year) 72
2. Latitude and Longitude: 21°20'30"/157°42'07"
3. Well Location (Legal Description): N/A
4. County: Honolulu State: Hawaii
5. SIC Classification: 4952

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Secondary treated municipal sewage
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: Gravity
5. Total Depth of Well: 220
6. Name, Age, and Depth of Injection Zone: Limestone, 73
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: None - Standby well for H-1 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Recent	0	19	clay, sand, coral
	Recent	19	54	clay
	Recent	73	64	dune limestone
	Recent	136	83	reef and associated limst.
	Recent	219	24	basaltic beach rock

(a)

WIC HI-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	73	19
(3) Thickness (Ft.)	146	54
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Recent	Recent
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	24°	
(11) Character and Areal Distribution	Reef and associated limestone	clay

C. Chemical Characteristics of Formation Fluids: 18,000 - 21,000 ppm chlorides 34,000 - 38,000 TDS

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
None					

4. Mineral Resources in Area: Limestone quarried

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: None

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Treated municipal sewage

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** Possible contamination of water from dissolved organics, heavy metals, pesticides and other components of the effluent.

4. **Reactivity with Surface Equipment Components:** None

5. **Degradability Level and Rate:** Possible degradation of dissolved organics under pressure

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Not sterile at injection, bacterial degradation of dissolved organics may occur.

7. **Pre-injection Waste Treatment:** Secondary treatment and chlorination

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		Casing	24	90
Intermediate				
Injection		PVC Plastic Pipe	--	89
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 4-inch annulus filled with cement - 15-inch casing to 24-inch casing to 24-inch casing filled with cement

3. **Well Head Equipment (Name and Models):** Sump tank

4. **Packers, Centralizers, and Other Subsurface Equipment:** PVC shoe at 90 ft.

5. **Bottom Hole Completion:** Open hole section 131 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Sump located directly over well hole

2. **Filters:** None

WIC HI-3

3. **Pumps:** Gravity flow

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	N/A	**Average**		**Maximum**	
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	N/A	**Average**		**Maximum**	
"					
"					
"					

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** N/A

B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

A. **Construction Requirements:** N/A

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: HI-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: County of Maui, Dapt of Public Works
Wailuku, Hawaii

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 05 (Month) 11 (Year) 72
2. Latitude and Longitude: 21°20'30"/157°42'07"
3. Well Location (Legal Description): N/A
4. County: Maui State: Hawaii
5. SIC Classification: 4952

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Secondary effluent from a domestic sewage treatment plant.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC HI-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: ______

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: ______

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: ______

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): ______

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: ______
   B. Conc. Dissolved Solids, mg/l: ______
   C. Specific Gravity: ______
   D. Temperature: ______
   E. pH: ______

(b)

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC HI-4

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: IA-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** NO-UP

Operating Company Name and Address: Quaker Oats Co.
Cedar Rapids, Iowa

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: N/A State: Iowa
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 2525 ft.
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) (Month) (Year) 55
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year) 65
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC IA-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

WIC IA-1

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC IA-1

3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: I1-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: NO-UP
Operating Company Name and Address: Velsicol Chemical Corp.
Marshall, Illinois

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 05 (Year) 73
2. Latitude and Longitude: 39°23'58"/87°42'40.0"
3. Well Location (Legal Description): 615 ft. S and 750 ft. W of the NE corner, SW 1/4, Sec. 12, T11N, R12W
4. County: Clark State: Illinois
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: The waste is a spent hypochlorite process liquor.
2. Date Well Permitted: 3/5/65 Completed: 4/11/65
3. Injection Rate: 86,000 gpd
4. Injection Pressure: Gravity to 82 psi
5. Total Depth of Well: 2636 plugged back to 1753' June 19, 1972
6. Name, Age, and Depth of Injection Zone: Devonian, 2372 ft. - plugged back to Salem
7. Date Injection Began: (Day) (Month) 11 (Year) 65
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) 15 (Month) 03 (Year) 72
10. Previous Mode of Disposal: Settled and overflowed to East Mill Creek

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC I1-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Salem	
(2) Depth (Ft.)	2372 1500	100 - 150
(3) Thickness (Ft.)	250 200	2200
(4) Formation Fluid Pressure, psi	1008 600	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Devonian Miss.	Penn. & Miss.
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Cherty dolomitic limestone - widespread	carbonates, shale, & sandstone-widespread

C. Chemical Characteristics of Formation Fluids: TDS = 14,000 ppm

3. **Geohydrology of Fresh Water and Other Useful Aquifers**

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	150			freshwater

4. **Mineral Resources in Area:** Oil and gas producing zones are within 4 miles of well.

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** N/A

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** 140,000 ppm Sodium Chloride, 25,000 ppm Sodium Hydroxide, 20,000 ppm Sodium Hypochlorite

2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: 59-417
   - B. Conc. Dissolved Solids, mg/l: 146,000-160,100
   - C. Specific Gravity: 1.15
   - D. Temperature: 133°F
   - E. pH: 10.5-11.5

(b)

WIC I1-1

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Corrosive to carbon steel

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Settling of suspended solids and filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	28 aph	8-5/8	417
Intermediate	7-3/8	Saran linned steel	4-1/2	2390
			2-3/8	1600
Injection		Injection casing	4-1/2	1530
Other		Aluminum casing corroded	4-1/2	1530-1756
		Plugged (lost equipment)		2536-2636

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing and 14-1/2 inch casing - cemented to surface.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized - 2390 to 2600 ft.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 20,000 gallon holding tank

2. **Filters:** Bag filter - 100 micron

WIC I1-1

3. **Pumps:** Injection pump - 70 gpm at 140 psi

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	week of 1/6/67	Average	62	Maximum	
"	week of 6/7/68		30		
"	week of 8/29/69		33		
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	1/6/67	Average	28" hg	Maximum	
"	6/7/68		24" hg		
"	8/29/69		0		
"					

3. **Annual Volume Injected, gal.**
A. 1972 4M B. 1971 29M C. 1970 22M

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Pressure and flow

B. **Sampling Frequency and Water Quality Parameters Measured:** Daily, suspended solids, dissolved solids

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** Well No. 1 is a standby well. No. 2 well is primary disposal unit.

3. **Regulatory Aspects**

A. **Construction Requirements:** Precautions taken to place saran lined casing in well without critical damage to lining

B. **Monitoring Requirements:** Monthly reported volumes, type and composition of waste materials injected, operational injections pressures and other data essential to operation of the deep well disposal facilities.

C. **Restrictions of Operation Procedures:** Maximum head pressure 453 psi

Well Id. Code: Il-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Cabot Corp
P.O. Box 188 - Tuscola, Illinois

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 05 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): 1745 "North and 800" of the SE corner, SE 1/4, SW 1/4, SE 1/4, T16N, R8E, 3rd Principal Meridian
4. County: Douglas State: Illinois
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: HCl waste from the manufacture of a finely divided silicon dioxide; 150 gpm chloride waste water, filtrate from the wastes produced by Staley Starch Co.; etching waste of R.R. Donnelly Co.
2. Date Well Permitted: 1/20/66 Completed: 4/66
3. Injection Rate: 3203 gpd
4. Injection Pressure: Gravity
5. Total Depth of Well: 5318
6. Name, Age, and Depth of Injection Zone: Eminence and Potosi, Cambrian, 4892
7. Date Injection Began: (Day) (Month) (Year) 66
8. Total Volume Injected to Date: 15,494,166 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: HCl was sold but loss of market forced implementation of disposal program.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC I1-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Eminence & Potosi	
(2) Depth (Ft.)	4892	300
(3) Thickness (Ft.)	193	4500
(4) Formation Fluid Pressure, psi	2035 psi @ 4861 ft.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Cambrian	Miss.-Cambrian
(8) Porosity %		
(9) Permeability, millidarcies	Very high	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Sandy dolomite limestone and dolo widely distributed	carbonates, shale and sandstone-widespread

C. Chemical Characteristics of Formation Fluids: Estimated to be greater than 20,000 ppm dissolved solids (based on swab samples)

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Oil and coal production

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Hydrochloric acid (33%) and a trace of suspended silicon dioxide

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.16
   D. Temperature: N/A
   E. pH: N/A

WDC I1-2

3. **Toxicity:** Possible tissue damage due to ingestion or prolonged contact with undiluted solution.

4. **Reactivity with Surface Equipment Components:** Possible corrosion to metal components.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Portions of the various wastewaters are settled and filtered.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	24# seamless steel	8-5/8	816
Intermediate	7-7/8	14# J-55	5-1/2	4600
		fiberglass	4-1/2	4898-4600
Injection		fiberglass	2	4570
Other			1-1/2	4570-4857

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 8-5/8-inch casing - cemented to surface; 5-1/2-inch casing - 1050 sks Pozmix to surface; 4-1/2-inch casing - 680 gal. resin.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Annulus is filled with diesel oil, no packer is used.

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC I1-2

3. **Pumps:** Teflon body Vanton pump with Harell rubber international parts.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
N/A		
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
N/A		
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Volume Monitor

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: System required to be constructed as specified in application for permit, or specific request made for any changes.

B. Monitoring Requirements: Measurement of injection volumes, injection pressure, and chemistry of injected wastewater.

C. Restrictions of Operation Procedures: EPA must be notified of any changes in facilities, procedures, or waste chemistry.

Well Id. Code: I1-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Jones & Laughlin Steel Company
Hennepin, Illinois

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 41°15'20"/89°20'02"
3. Well Location (Legal Description): 390 ft. north and 190.8 ft. west of the SE corner of the SW 1/4, SW 1/4, sec. 3, T 32 N, R2W, Putnam County
4. County: Putnam State: Illinois
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastewater from steel pickling. Principle constituents are HCl, $FeCl_2$, and dilute $CrCl_3$
2. Date Well Permitted: 12/67 Completed:
3. Injection Rate: 100,000 gpd
4. Injection Pressure: 150 psi
5. Total Depth of Well: 4,846 ft.
6. Name, Age, and Depth of Injection Zone: Mt. Simon; Cambrian; 3,109 ft.
7. Date Injection Began: (Day) (Month) 12 (Year) 67
8. Total Volume Injected to Date: 11,328,876 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: None - The injection well was constructed before the plant began operation.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Pleistocene	0	175	sand, gravel
	Pennsylvanian	175	210	
	Silurian	385	545	
	Ordovician	930	1197	
Knox Group	Cambrian	2127	253	
Ironton	Cambrian	2535	170	sandstone
Eu Claire	Cambrian	2705	404	shale
Mt. Simon	Cambrian	3109	1734	sandstone

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	Eau Claire Formation
(2) Depth (Ft.)	3,109	2,703
(3) Thickness (Ft.)	1,734	404
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi	3.109 psi at top	2,703 at top
(6) Hydrofracturing Pressure, psi	3.109 psi	2,703
(7) Age of Unit	Cambrian	Cambrian
(8) Porosity %	1.4-19% av. 12-14%	
(9) Permeability, millidarcies	1.0-1,160 md.av.20-	100 md.
(10) Reservoir Temperature, °C	120°	120°
(11) Character and Areal Distribution	Sandstone - regionally distr.	Shale - regionally distributed

C. Chemical Characteristics of Formation Fluids: Total dissolved solids about 60,000 ppm. Chlorides about 35,000 pp, PH, specific gravity, radioactivity

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Glacial drift	0-175	175	Widespread	gravel, sand	freshwater
St. Peter	1,474	118	Widespread	sandstone	TDS=585 mg/l
Galesville-Ironton	2,535	170	Widespread	sandstone	fresh

4. Mineral Resources in Area: Coal is the only known mineral resource in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: No other wells that penetrate the Mt. Simon are present in the area of the injection well.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Wastewater from steel pickling including Hcl, $FeCl_2$, iron, aluminum, and chromate.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: Unknown
   - B. Conc. Dissolved Solids, mg/l: 70,000 to 200,000
   - C. Specific Gravity: 1.2
   - D. Temperature: 106°F
   - E. pH: 1-2

(b)

3. **Toxicity:** Trivalent chromium of this waste exceeds water standards for domestic water supply; ferrous chloride concentration exceeds the taste threshold.
4. **Reactivity with Surface Equipment Components:** Waste is highly corrosive. All surface equipment and wll tubing must be acid resistent.
5. **Degradability Level and Rate:** There should be no biodegradability in the formation due to the lack of organics.
6. **Biological Level at Injection and Estimated Biological Level After Injection:** Due to the low pH of the wastewater, and the concentration of trivalent chromium, the biological level at injection and after injection would be negl.
7. **Pre-injection Waste Treatment:** Settling and filtration.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2"	H-20 48 Short T&CR-2	13-3/8"OD	308'
Intermediate	12-1/4"	J-55 36 Short T&CR-2	9-5/8"OD	2,703'
	8-3/4"	J-55 23 Short T&CR-2	7" OD	3,108'
Injection		Fibrecast Tubing	3-1/2"OD	3,700'
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** Cemented from casing seat to surface - all strings
3. **Well Head Equipment (Name and Models):** N/A
4. **Packers, Centralizers, and Other Subsurface Equipment:** Casing strings were run with centralizers, guide shoes or float shoes and float collars.
5. **Bottom Hole Completion:** Open hole 3,108 to 4,846 ft.
6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 150,000 gal. holding tanks are used before and after filtration.
2. **Filters:** Durco diatomaceous earth filters are used to remove particles larger than 2 microns

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3. **Pumps:** A centrifugal pump is used for wastewater injection and a positive displacement pump is used to maintain pressure in the annulus between the tubing and 7" closing.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average	Maximum
"	April 1969	190	
"	May 1970	179	
"	July 1971	135	

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	Maximum
	April 1969	256	
"	May 1970	265	
"	July 1971	265	
"	Jan. 1972	313	

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Injection tubing and annulus pressure and injection rate are monitored and reported monthly.

B. Sampling Frequency and Water Quality Parameters Measured: Periodic composite sampling and water quality parameters measured.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Injection pressure and annulus pressure measured continuously.

2. Contingency Plan for Well Failure During Operation: Three day holding tank capacity.

3. Regulatory Aspects

A. Construction Requirements: Well required to be constructed as specified in approved design. Constructed well meets those specifications.

B. Monitoring Requirements: Monitoring of inspection and annulus pressure, flow rate, and wastewater quality required.

C. Restrictions of Operation Procedures: Any deviation in well construction, present operating procedures, or character of injected wastewater must be approved.

Well Id. Code: IL-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** DN
Operating Company Name and Address: American Potash and Chemical Company
West Chicago, Illinois

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): SW 1/4, Sec. 9, T39N, R9E
4. County: Dupage State: Illinois
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: None
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 4043 ft. plugged back to 2130 ft.
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian 1820
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Pleistocene	0	93	gravel, sand, clay
	Silurian	93	184	limestone, dolomite
Maguoketa	Ordovician	277	89	shale
Galena	Ordovician	366	181	
	Ordovician	547	113	
Ancell	Ordovician	660	390	
	Cambrian	1050	770	
Mt. Simon	Cambrian	1820		sandstone, shale

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: About 100,000 parts per million dissolved solids in the basal Mt. Simon

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Freshwater occurs in all units except lower Mt. Simon					

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): None

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection:
N/A

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps: ______

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______

B. Sampling Frequency and Water Quality Parameters Measured: ______

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects

A. Construction Requirements: ______

B. Monitoring Requirements: ______

C. Restrictions of Operation Procedures: Not permitted

Well Id. Code: IL-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: U.S. Industrial Chemicals Co.
P.O. Box 218 - Tuscola, Illinois

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): 430 ft. south and 1135 ft. east of the NW corner of Sec. 31, T16N, R8E
4. County: Douglas State: Illinois
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from the various petrochemical and agricultural chemicals manufacture.
2. Date Well Permitted: Completed: 5/9/70
3. Injection Rate: 401,638 gpd
4. Injection Pressure: 52psi
5. Total Depth of Well: 5,524
6. Name, Age, and Depth of Injection Zone: Eminence and Potosi, Cambrian, 5015
7. Date Injection Began: (Day) 04 (Month) 08 (Year) 70
8. Total Volume Injected to Date: 226,320,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Eminence/Potosi	
(2) Depth (Ft.)	5015	
(3) Thickness (Ft.)	509	
(4) Formation Fluid Pressure, psi	2309	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Cambrian	
(8) Porosity %	25	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Dolomite with porous and non-porous zones very widely spread	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: Oil production and coal mined west of the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Wastewater containing $CaSO_4$, 3% phosphoric acid, 1-1/2% sulfuric acid, 0.7% flouride, carbon, and other salts.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.034 at 60°F
   - D. Temperature: N/A
   - E. pH: 1.0

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal

7. **Pre-injection Waste Treatment:** Holding ponds

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2		13-3/8	219
Intermediate	12-1/4	H-40	9-5/8	2810
	8-3/4	J-55	7	5015
Injection	6-1/2	EUE J-55 w/plastic lining	2.825	4990
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8 inch casings - 200 sks w/3% $CaCl_2$, 9-5/8 inch casings - 700 sks Howco Lite + Class A; 7 inch casing - 850 sks

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Halliburton R-4 tubing packer; centralizers every 90 ft. on 9-5/8 "and 7" casing annulus filled w/fresh water and 2bbls Coretron w/crude oil at bottom.

5. **Bottom Hole Completion:** Open hole perforated 3 shots/ft. 5176 and 5186 to 5194 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 10,000 gal. 28% HCl @5015-5524 ft.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Waste transferred from lagoon No. 3 through 4 inch diameter plastic pipe

2. **Filters:** Strainer on well head

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpd (During Life of Well to Present)

Date(s)	9/1/70	Average	485,000	Maximum	
"	3/22/71		370,000		
"	8/31/71		446,000		
"	1/11/72		432,000		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	9/1/70	Average	30-100	Maximum	
"	3/22/71		52		
"	8/31/71		52		
"	1/11/72		7		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure/Volume Monitor

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Well was to be constructed as designed and approved.

B. Monitoring Requirements: Monthly report of operating pressures and injected volumes, annulus pressure, waste character and any other significant operational information.

C. Restrictions of Operation Procedures: Injection pressure not to exceed 0.65 psi/ft. of depth at the bottom of the hole.

Well Id. Code: IL-7

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Vesicol Chemical Corporation
Marshall, Illinois

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 05 (Year) 73
2. Latitude and Longitude: 39°23'55"/87°42'40"
3. Well Location (Legal Description): SW 1/4 Sec. 12, T11N, R12W
4. County: Clark State: Illinois
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: The waste is a spent hypochlorite process liquor.
2. Date Well Permitted: Completed: 3/15/72
3. Injection Rate: 22M gallons/year
4. Injection Pressure: 90 psi
5. Total Depth of Well: 6007 plugged back to 2737'
6. Name, Age, and Depth of Injection Zone: Devonian, 2440'
7. Date Injection Began: (Day) 15 (Month) 03 (Year) 72
8. Total Volume Injected to Date: 28M (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Injected into IL-1

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geolcgical Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	2737	100-150
(3) Thickness (Ft.)	374	2200
(4) Formation Fluid Pressure, psi	1000	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	Penns. & Miss.
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone widespread	carbonates, shale, & sandstone, widespread

C. Chemical Characteristics of Formation Fluids: 14,000 ppm dissolved solids.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	150			Freshwater

4. Mineral Resources in Area: Oil and gas producing within 4 miles of well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 140,000 ppm sodium chloride, 25,000 ppm sodium hydroxide; 20,000 ppm sodium hypochlorite

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 50-580
   B. Conc. Dissolved Solids, mg/l: 125,000-170,000
   C. Specific Gravity: 1.10
   D. Temperature: 100°F
   E. pH: 10.5-11.5

(b)

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Corrosive to carbon steel

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Settling and filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	18"	48.00# H-40	13-3/8"	62'
Intermediate	12-1/4"	32.20# H-40	9-5/8"	1083
Injection	8-3/4"	23.00# K-55	7"	2428'
Other		9.50# K-55 PVC Lined	4-1/2"	2444'

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8", 9-5/8" and 7" casing cemented to surface

3. Well Head Equipment (Name and Models): Hinderliter casing head

4. Packers, Centralizers, and Other Subsurface Equipment: 7" casing: 9 centralizers, 6 cement baskets, pack off collar, 9-5/8" casing: 5 centralizers, 2 scratchers, guide shoe

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 20,000 gallon holding tank, 4" piping.

2. Filters: Bag filter; 100 micron

3. **Pumps:** Injection pump 70 gpm at 14 psi

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	4/5/72	Average	57	Maximum	
"	6/7/72		57		
"	9/6/72		38		
"	2/7/73		48		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	4/5/72	Average	15	Maximum	
"	6/7/72		52		
"	9/6/72		69		
"	2/7/73		81		

3. Annual Volume Injected, gal.

A. 1972 22M B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure and flow measurement monitoring well for observing formation fluid movement and pressure changes.

B. Sampling Frequency and Water Quality Parameters Measured: Daily, suspended solids dissolved solids, NaCl, NaOH

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Monthly or quarterly

2. Contingency Plan for Well Failure During Operation: Utilize standby Well (No. 1) for chlordane waste. Accumulate other plant wastes.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: Monthly reported volumes, type & composition of waste materials, injection pressures.

C. Restrictions of Operation Procedures: Maximum head pressure 643 psi

Well Id. Code: IL-8

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: SNA Operational Status: SNA

Operating Company Name and Address: Velsicol Chemical Co.
Marshall Illinois

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 23 (Month) 05 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 12, T11N, R11W
4. County: Clark State: Illinois
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 6007 ft.
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l:
   - B. Conc. Dissolved Solids, mg/l:
   - C. Specific Gravity:
   - D. Temperature:
   - E. pH:

3. Toxicity: ______________________________

4. Reactivity with Surface Equipment Components: ______________________________

5. Degradability Level and Rate: ______________________________

6. Biological Level at Injection and Estimated Biological Level After Injection: ______________________________

7. Pre-injection Waste Treatment: ______________________________

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: ______________________________

3. Well Head Equipment (Name and Models): ______________________________

4. Packers, Centralizers, and Other Subsurface Equipment: ______________________________

5. Bottom Hole Completion: ______________________________

6. Hydraulic Fracturing, Acidizing Programs, etc.: ______________________________

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: ______________________________

2. Filters: ______________________________

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3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: I1-9

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: Allied Chemical Corp.
Danville, Illinois

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 23 (Month) 5 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sw 1/4, N.W. 1/4, Sec 12, T19N, R11W
4. County: Vermilion State: Illinois
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC IL-9

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

WIC IL-9

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC IL-9

3. **Pumps:** ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ __________ B. 19__ __________ C. 19__ __________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: IN-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: American Cyanimid Company, P.O. Box 262
Michigan City, Indiana 46360

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 31 (Month) 1 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 22, T38N, R4W
4. County: LaPorte State: Indiana
5. SIC Classification: 2819

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Floor washing waste and filter washing waste
2. Date Well Permitted: 8-51 Completed:
3. Injection Rate: 500,000 gpd
4. Injection Pressure: 35 psi
5. Total Depth of Well: 650
6. Name, Age, and Depth of Injection Zone: Devonian & Silurian, 270
7. Date Injection Began: (Day) (Month) 8 (Year) 51
8. Total Volume Injected to Date: 2,073,600.00 (8/67) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC IN-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	270	175
(3) Thickness (Ft.)	397	95
(4) Formation Fluid Pressure, psi	0.43 psi/ft	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian & Silurian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite, limestone	dolomite & limestone possibly with some shale

C. Chemical Characteristics of Formation Fluids: 50mg/1 H_2S, 4000mg/1 NaCl

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
drift	0	175	variable	sand, gravel	fresh

4. Mineral Resources in Area: peat, marl and sand are mined in LaPorte County.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 6500ppm Na_2SO_4, 5000 ppm ammonium sulfate, 120 ppm acidity 6,021ppm Na_2O, 187ppm Al_2O_3, 7681ppm SO_4
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/1: 118
   B. Conc. Dissolved Solids, mg/1: 14,000
   C. Specific Gravity: 1.0
   D. Temperature: 60°F
   E. pH: 4.6

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			16	257
Intermediate			12	170-257
Injection		Carlon Tubing	6	270
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open Hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: three settling tanks in series

2. Filters: N/A

WIC IN-1

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Monthly operational reports are filed with the State Board

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Compeleted, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources

B. Monitoring Requirements: monthly operatonal reports are filed with the state board

C. Restrictions of Operation Procedures: Must operate as permitted

Well Id. Code: IN -2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: American Cyanimid Company
P.O. Box 262, Michigan City, Indiana 46360

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 31 (Month) 1 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec 22, T38N, R4W - 850 ft. east of the IN-1 well
4. County: LaPorte State: Indiana
5. SIC Classification: 2819

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Floor washing waste and filter washing waste
2. Date Well Permitted: 9-52 Completed:
3. Injection Rate: 280,000,000 gpy
4. Injection Pressure: 35 psi
5. Total Depth of Well: 295
6. Name, Age, and Depth of Injection Zone: Devonian, 255
7. Date Injection Began: (Day) (Month) 9 (Year) 1952
8. Total Volume Injected to Date: 1,940,000,000 (8/67) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC IN-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	255	175
(3) Thickness (Ft.)	40	95
(4) Formation Fluid Pressure, psi	0.43 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite, limestone	dolomite, limestone possibly with some shale

C. Chemical Characteristics of Formation Fluids: 50 ppm H_2S, 4000 ppm NaCl

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	175	variable	sand, gravel	fresh

4. Mineral Resources in Area: Peat, marl, and sand mined in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 6500 ppm $NaSO_4$, 5000 ppm ammonium sulfate, 6000 ppm Na_2O, 187 ppm Al_2O_3, 7700 ppm SO_4

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: 118
   - B. Conc. Dissolved Solids, mg/l: 14,000
   - C. Specific Gravity: 1.0
   - D. Temperature: 60° F
   - E. pH: 4.6

(b)

WIC IN-2

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: probably not sterile at injection; bacterial activity minimal

7. Pre-injection Waste Treatment: Sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			10-3/4	255
Intermediate				
Injection		Carlon Tubing	6	270
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open Hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: three settling tanks in series

2. Filters: N/A

WIC IN-2

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injectior Rate, gpm (During Life of Well to Present)

Date(s) N/A Average ____ Maximum ____
"
"
"

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) N/A Average ____ Maximum ____
"
"
"

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Monthly operational reports filed with the Board

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped, and maintained in a manner that will prevent pollution of fresh water or endanger any natural resource

B. Monitoring Requirements: monthly operational reports are filed with State Board

C. Restrictions of Operation Procedures: must operate a permitted

Well Id. Code: IN-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0
Operating Company Name and Address: Indiana Farm Bureau Co-Op Assn. Inc.
Mt. Vernon, Indiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 04 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 6, T7S, R13W
4. County: Posey State: Indiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Water, sodium hydroxide, sodium sulfite, sodium mercaptide
2. Date Well Permitted: 4/50 Completed:
3. Injection Rate: 210 gpd
4. Injection Pressure: 200 psi
5. Total Depth of Well: 2427' plugged back to 2328'
6. Name, Age, and Depth of Injection Zone: Tar Springs, Mississippian, 2286
7. Date Injection Began: (Day) 04 (Month) 10 (Year) 55
8. Total Volume Injected to Date: 453,600 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Pennsylvanian			
Kincaid	Mississippian			limestone
Menard	Mississippian			limestone
Vienna	Mississippian			sandy limestone
Tar Springs	Mississippian			sandstone

(a)

WIC IN-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Tar Springs	Approx. 6'of tight
(2) Depth (Ft.)	2286	Calcareous sand on top
(3) Thickness (Ft.)	97	of Tar Springs overlain
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	with shale
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Miss.	
(8) Porosity %	20	
(9) Permeability, millidarcies	200+	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	200		sand, clay	3000 ppm TDS

4. Mineral Resources in Area: Clay and marl are recovered near the well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Water, sodium hydroxide, sodium mercaptide, sodium sulfide

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.12
   - D. Temperature: N/A
   - E. pH: N/A

(b)

WIC IN-3

3. **Toxicity:** Mercaptous toxic to fish. NaOH toxic to humans with total dose of 1.95 gm.

4. **Reactivity with Surface Equipment Components:** Possible corrosion to metal components.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Settling

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13		10-3/4	
Intermediate	8-3/4		5-1/2	
Injection			2-1/2	
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 100 sx Hi-Early; 5-1/2 inch casing - 150 sx Hi-Early

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** No packer

5. **Bottom Hole Completion:** Perforations - 49 holes 2302-2808 ft. rippled 2312/2328 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acid - 1500 gal. 15% muretic acid w/Dowell W9 and L-1 additives; fractured - water frac. 3000 gal. water 6000 lbs. sand break 2500 psi final 1800 psi

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC IN-3

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) Average 4 to 5 gpm Maximum
"
"
"

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) Average 200 Maximum 300
"
"
"

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Volume and pressure monitoring

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: IN-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** NO-UP

Operating Company Name and Address: FMC Corporation
P.O. Box 34 - Newport, Indiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 12 (Year) 72
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): NE 1/4, NW 1/4, Sec. 9, T16N, R6W
4. County: Vermillion State: Indiana
5. SIC Classification: 3561

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: Completed: 5/22/60
3. Injection Rate: 50 gpm
4. Injection Pressure: 1000 psi
5. Total Depth of Well: 6160
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian, 5260
7. Date Injection Began: (Day) 15 (Month) 10 (Year) 60
8. Total Volume Injected to Date: 150,000,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Cincinnatian	Ordovician	1880	319	shale
Trenton	Ordovician	2199	161	limestone
Black River	Ordovician	2360	450	limestone
Knox	Cambrian	2819	1600	dolomite
Eau Claire	Cambrian	4420	840	limestone, shale
Mt. Simon	Cambrian	5260	900	limestone

WIC IN-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	5260	
(3) Thickness (Ft.)	900	5000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Cambrian	Penn. - Camb.
(8) Porosity %	6	
(9) Permeability, millidarcies	6 - 8	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	shale, sandstone extensive	shale, carbonates sandstone extensive

C. Chemical Characteristics of Formation Fluids: 204,400 ppm TDS; 125,000 ppm Cl^-; 508 ppm SO_4; 116 ppm $(CO_3)_2$; 22,400 ppm Ca; 2840 ppm Mg; pH=4.5

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: The area around the disposal well is an area of large coal deposits. Over 150 million tons of coal has been produced from the deposits.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 22,000 ppm Ca; 9,000 ppm Fe; 3000 ppm Mg; 125,000 ppm Cl^-; 10 ppm solids (after filtration)

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 10
   B. Conc. Dissolved Solids, mg/l: 200,000
   C. Specific Gravity: 1.09
   D. Temperature: N/A
   E. pH: 4.9

WIC IN-4

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Cathode type protection system installed.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Settling, pressure leaf filtration, pH control.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-3/4		10-3/4	498
Intermediate				
Injection	8-3/4	23#	7	5450
Other	7-7/8	Open Hole		6160

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: None - formation is highly fractured; 250,000 gallon fresh water buffer zone.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 13,000 gallon waste rundown tank; surge tank

2. Filters: Leaf and cartridge filters

WIC IN-4

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average	50	Maximum	1000
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	1000	Maximum	1500
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Volume and pressure monitor

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: IN-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Bethlehem Steel Co. Burns Harbor Plant
Box 248 Chestertown, Indiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 23 (Month) 05 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 28; NW 1010' NL 1710' WL TWP 37N Range 6W
4. County: N/A State: Indiana
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Steel mill waste HCl
2. Date Well Permitted: 11/67 Completed:
3. Injection Rate: 125 gpm
4. Injection Pressure: 700 psi
5. Total Depth of Well: 4305
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian, 2535
7. Date Injection Began: (Day) (Month) 11 (Year) 67
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Silurian	256	700	shale
Trenton	Ordovician	958	250	limestone
Black River	Ordovician	1208	100	limestone
Knox	Cambrian	1308	300	dolomite
Eau Claire	Cambrian	1625	900	limestone
Mt. Simon	Cambrian	2535	1700	sandstone
	Pre-Cambrian	4263		

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	2535	
(3) Thickness (Ft.)	1700	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cambrian	
(8) Porosity %	9	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Sandstone	

C. Chemical Characteristics of Formation Fluids: 40,000 mg/l NaCl, 7000 mg/l Ca.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	190	Variable	sand and gravel	fresh

4. Mineral Resources in Area: Clay and marl are mined in Porter Co.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 6-10% H_2SO_4, 14-18% $FeSO_4$, 41,000 ppm Cl, 22,000 ppm Na_2O

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 71,600
   C. Specific Gravity: N/A
   D. Temperature: 40-190°F
   E. pH: N/A

(b)

WIC IN-5

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Filtration, addition of biocide and corrosion and oxygen inhibitors.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	24		20	
Intermediate	15	H-40 32#		
	8-3/4	H-40 17#	7	
Injection	8-3/4	J-55 Tubing Penton Coated	3 1/2 OD	
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 2-Baker Model D Packers

5. Bottom Hole Completion: Perforated completion bottom 200 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. **Filters:** Pre-Coat filter 2 microns

WIC IN-5

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	overall	Average	125	Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	700	Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: IN-6

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Bethlehem Steel Co. Burns Harbor Plant
Box 248 Chestertown, Indiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 23 (Month) 05 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): T-37N, R6W, Sec. 30
4. County: Porter State: Indiana
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste effluent from a coke plant - aqueous ammonium salts containing phenols and cyanides.
2. Date Well Permitted: 4/4/68 Completed:
3. Injection Rate: 125 gpm
4. Injection Pressure: 700 psi
5. Total Depth of Well: 3945
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian, 2530
7. Date Injection Began: (Day) 04 (Month) 04 (Year) 68
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Silurian	250	695	shale and limestone
Trenton	Ordovician	945	215	limestone
Black River	Ordovician	1160	185	limestone
Knox	Cambrian	1355	300	dolomite
Eau Claire	Cambrian	1662	900	limestone
Mt. Simon	Cambrian	2510	3945	sandstone

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	2530	
(3) Thickness (Ft.)	1415	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cambrian	
(8) Porosity %	10 - 20	
(9) Permeability, millidarcies	20 - 100	
(10) Reservoir Temperature, °C	33°	
(11) Character and Areal Distribution	Sandstone	

C. Chemical Characteristics of Formation Fluids: 98,000 ppm TDS; 5800 ppm Cl; 1210 ppm SO_4; 78.1 ppm HCO_3; 8140 ppm Ca; 1320 ppm Mg; 27,000 ppm Na.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	190	variable	sand, clay	fresh

4. Mineral Resources in Area: Clay and marl are mined in Porter Co.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste effluent including aqueous ammonia salts, phenol, and cyanides

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection:
N/A

7. Pre-injection Waste Treatment: Oil skimming sludge removal, filtration, temperature reduction and addition of biocide

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17	H-40 55#	13-3/8	226
Intermediate	12-1/4	J-55 40#	9-5/8	1437
	8-3/4	J-55 23#	7	2530
Injection	6-1/4			
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: Surface string 300 sks; intermediate strings 1025 sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole completion

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 2 - 400,000 gal. storage tanks
1 - 60,000 gal. storage tank

2. Filters: 2 - diatomaceous earth filters

WIC IN-6

3. Pumps: Other - 2 - heat exchangers 140°F to 80° F

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Overall	Average	125	Maximum	450
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	700	Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: IN-7

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Bethlehem Steel Co., Burns Harbor Plant
Box 248 Chestertown, Indiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 23 (Month) 05 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): T-37N, R6W, Sec. 29
4. County: Porter State: Indiana
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Aqueous ammonium salts containing phenols and cyanides
2. Date Well Permitted: 3/22/68 Completed:
3. Injection Rate: 32 gpm
4. Injection Pressure: 15 psi
5. Total Depth of Well: 4301
6. Name, Age, and Depth of Injection Zone: Eau Claire and Mt. Simon, Cambrian, 1655 and 2521
7. Date Injection Began: (Day) 22 (Month) 03 (Year) 68
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Silurian	Silurian	238	520	shale, limestone
Cincinnatian	Silurian	758	200	limestone
Trenton	Ordovician	945	225	limestone
Black River	Ordovician	1170	170	limestone
Knox	Cambrian	1340	315	dolomite
Eau Claire	Cambrian	1655	885	limestone
Mt. Simon	Cambrian	2530	1744	sandstone

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Eau Claire/Mt. Simon	
(2)	Depth (Ft.)	1655 2521	
(3)	Thickness (Ft.)	855 1744	
(4)	Formation Fluid Pressure, psi		
(5)	Lithostatic Pressure, psi		
(6)	Hydrofracturing Pressure, psi		
(7)	Age of Unit		
(8)	Porosity %	10-20	
(9)	Permeability, millidarcies	20-100	
(10)	Reservoir Temperature, °C	33°	
(11)	Character and Areal Distribution	limestone/sandstone	

C. Chemical Characteristics of Formation Fluids: 98,000 ppm TDS; 5800 ppm Cl; 1210 ppm SO_4; 78 ppm HCO_3; 8140 ppm Ca; 1320 ppm Mg; 27,000 ppm Na.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	190	variable	sand, gravel	fresh

4. Mineral Resources in Area: Clay and marl are mined in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Oil skimming sludge removal filtration, temperature reduction and addition of biocide.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	H-40 55#	13-3/8	230
Intermediate	12-1/4	J-55 48#	9-5/8	1435
	8-3/4	23#	7	2521
Injection	6-1/4	Open hole		2521
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 casing - 300 sks

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 2 - 400,000 gal. storage tanks 1 - 60,000 gal. storage tank

2. Filters: 2 - diatomaceous earth filters

WIC IN-7

3. Pumps: Other - 2- heat exchangers 140°F to 80°F

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) Overall Average 32 Maximum

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) Average 15 Maximum

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: Daily injection. Volume and data on waste chemistry to be filed monthly.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: IN-8

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0
Operating Company Name and Address: Midwest Steel Co. Div. National Steel Corp.
Portage City, Indiana 46368

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 23 (Month) 05 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 25, T37N, Range 6W
4. County: Porter State: Indiana
5. SIC Classification: 3479

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste pickle from a metal production operation.
2. Date Well Permitted: 2/65 Completed:
3. Injection Rate: 275 gpm
4. Injection Pressure: 0-30 psi
5. Total Depth of Well: 4308
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian, 2160
7. Date Injection Began: (Day) (Month) 02 (Year) 65
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Silurian	248		sand
Trenton	Ordovician	936		limestone
Black River	Ordovician	1165		limestone
Knox	Cambrian	1345		dolomite
Eau Claire	Cambrian	1645		limestone and shale
Mt. Simon	Cambrian	2160		sandstone
	Pre-Cambrian	4259		

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	2160	
(3) Thickness (Ft.)	2100	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cambrian	
(8) Porosity %	18	
(9) Permeability, millidarcies	40-50	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Sandstone	

C. Chemical Characteristics of Formation Fluids: 40,000 mg/l NaCl and 7,000 mg/l Ca

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	190	variable	sand and clay	

4. Mineral Resources in Area: Peat and marl are recovered from the county in which the well is located.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 6-10% H_2SO_4, 14 to 18% Ferrous Sulfate, contains some Na_2CrO_7

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.14
   D. Temperature: 130°F to 180°F
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20		16	180
Intermediate	13-3/8		10-1/2	400
	9-5/8		7	2750
Injection		Fibercast	2	800
Other		Fibercast	3	800 to 2750

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): Packer set near bottom of 7" casing string.

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole completion

6. Hydraulic Fracturing, Acidizing Programs, etc.: HCl - acid buffer injection injection fresh water with chlorine and Biocide B-9 volume-35,000,000 gal.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 100,000 gal. storage tank; 3,000 gal. surge tank; 80 inch continuous pickle line.

2. Filters: Pre-coat filters 0.5 micron

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3. Pumps: 2-booster pumps and 2 (75 gpm) injection pumps

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average	275	Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	0	Maximum	30
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: IN-9

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: U.S. Steel Co.
208 S. LaSalle Street, Chicago, Illinois

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 23 (Month) 05 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): SW 1/4, SE 1/4, SW 1/4, Sec. 29, T37N, R8W
4. County: Lake State: Illinois
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Spent pickle liquor
2. Date Well Permitted: 1/7/65 Completed:
3. Injection Rate: 210 gpm
4. Injection Pressure: 200 psi
5. Total Depth of Well: 4303
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian, 2422
7. Date Injection Began: (Day) (Month) 01 (Year) 65
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Trenton	Ordovician	845	200	limestone
Black River	Ordovician	1037	160	limestone
Knox	Cambrian	1190	370	dolomite
Eau Claire	Cambrian	1567	900	limestone, shale
Mt. Simon	Cambrian	2422	1850	sandstone

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	2422	
(3) Thickness (Ft.)	2100	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %	14.3	
(9) Permeability, millidarcies	427	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Sandstone	

C. Chemical Characteristics of Formation Fluids: 40,000 mg/1 NaCl, 7000 mg/1 Ca

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	160	variable	sand, gravel	fresh

4. Mineral Resources in Area: Peat is recovered from pits in the general area of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Spent pickle liquor sulfuric acid - 8 to 37%, ferrous sulfate 18 to 25%, Chromic acid 2-6%, hydroclaric acid 1%, FeCl, 15-20%
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.06 - 1.13
   D. Temperature: N/A
   E. pH: N/A

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Filtration and skimming

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	H-40	16	182
Intermediate	13-3/4	H-40	10-3/4	823
	9-5/8	J-55	7	2452
Injection		Fibercast	4-1/2	
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 16" - 375sks, 10-3/4" - 550sks, 7" - 650sks. + 40sks. resin

3. **Well Head Equipment (Name and Models):** Flowmeter

4. **Packers, Centralizers, and Other Subsurface Equipment:** Totalizer

5. **Bottom Hole Completion:** Open hole completion

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 2,000 Dowell Mud acid, buffer injection 600,000 gal. chlorinated water.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average 210	Maximum 240
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average 200	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: IN-10

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: General Electric Co.
Lexan Lane - Mt. Vernon, Indiana 47620

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 04 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 18, T7S, R13W
4. County: Posey State: Indiana
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste from a phenolic distillation facility and acid regeneration system.
2. Date Well Permitted: Completed: 2/67
3. Injection Rate: 30 gpm
4. Injection Pressure: 465 psi
5. Total Depth of Well: 3054
6. Name, Age, and Depth of Injection Zone: Bethel, Mississippian, 2760
7. Date Injection Began: (Day) (Month) 02 (Year) 67
8. Total Volume Injected to Date: 53,285,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Kinkaid	Mississippian	1790	296	sand, sandstone, shale
Mernard	Mississippian	2086	262	
Vienna	Mississippian	2248	132	sandy limestone
Glen Dean	Mississippian	2380	326	limestone, shale
Barlow	Mississippian	2606	29	shale
Cypress	Mississippian	2635	115	shale
Bethel	Mississippian	2760	46	sandstone

B. **Geologic Description of Injection Unit and Other Possible Units**

	Injection Unit	Confining Bed
(1) Name	Bethel	
(2) Depth (Ft.)	2760	200
(3) Thickness (Ft.)	46	2500
(4) Formation Fluid Pressure, psi	0.45 psi. ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Mississippian	Pennsylvanian & Miss.
(8) Porosity %	18	
(9) Permeability, millidarcies	100	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	shale, sandstone, and carbonates, extensive

C. **Chemical Characteristics of Formation Fluids:** 110,000 ppm Cl, 11,000 ppm Total Hardness, 64000 ppm Ca Hardness, 260 ppm Alkalinity, 101 ppm Acidity to Phenolphthalein, 6250 ppm SO_4, 33.5 ppm Fe, pH-7.6

3. **Geohydrology of Fresh Water and Other Useful Aquifers**

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	200	variable	sand granvel	fresh

4. **Mineral Resources in Area:** Over 30 million barrels of oil have been produced from the overlying Waltersburg sand. Coal is also produced from the area in large amounts.

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** N/A

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** Water containing 3% phenol, HCl neutralized with NaOH

2. **Physical/Chemical Description**
   A. **Conc. Suspended Solids, mg/l:** N/A
   B. **Conc. Dissolved Solids, mg/l:** N/A
   C. **Specific Gravity:** 1.003
   D. **Temperature:** N/A
   E. **pH:** 10-13

3. Toxicity: Minimal recommended levels of phenol for domestic water supplies 0.001 mgl.

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: pH adjustment, sedimentation, filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			8-5/8	
Intermediate	6-3/4		4-1/2	
Injection		Tubing	2-3/8	
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 4-1/2 inch casing - 660 sks 18% salt saturated pozmix cement.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Annulus filled with diesel oil, packer on 2-3/8 inch tubing.

5. Bottom Hole Completion: Open hole completion

6. Hydraulic Fracturing, Acidizing Programs, etc.: Fresh water buffer and treatment with an iron chelating agent, 4000 gal. 25% HCL.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: Two cartridge filters - 20 micron cartrige

WIC IN-10

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Jan 1, 1970	Average	34	Maximum	
"	Jan 1, 1971		28		
"	Jan 1, 1972		16		
"	July 1972		19		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Jan 1, 1970	Average	410	Maximum	480
"	Jan 1, 1971		220		260
"	Jan 1, 1972		320		340
"	July 1972		460		490

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Volume and pressure monitor.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: Monthly reports to State.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: IN-11

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: Inland Steel Co.
30 W. Monroe St., Chicago, Illinois 60603

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 23 (Month) 05 (Year) 73
2. Latitude and Longitude: 41°39'07"/87°27'42"
3. Well Location (Legal Description): Lake Michigan Fill (Proj. Sec. 14)
37N-9W, 2175' SL of Proj. Sec. 14, 650" WL of Proj. Sec. 14
4. County: Lake State: Illinois
5. SIC Classification: 3310

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste pickle liquor
2. Date Well Permitted: 3/68 Completed:
3. Injection Rate: 55 gpm
4. Injection Pressure: 0-230 psi
5. Total Depth of Well: 4348
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian, 2360
7. Date Injection Began: (Day) (Month) 03 (Year) 68
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Cincinnatian	Ordovician	680	100	shale
Trenton	Ordovician	780	220	limestone
Black River	Ordovician	1000	130	limestone
St. Peter	Ordovician	1130	340	sandstone
Eau Claire	Cambrian	1470	890	limestone
Mt. Simon	Cambrian	2360	1980	sandstone
	Pre-Cambrian	4340		granite

(a)

WIC IN-11

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	2360	
(3) Thickness (Ft.)	1980	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cambrian	
(8) Porosity %	12	
(9) Permeability, millidarcies	316	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Sandstone	

C. Chemical Characteristics of Formation Fluids: 123,000 ppm TDS; 75,900 ppm Cl; 1300 ppm SO_4; 31,500 ppm Na; 12,400 ppm Ca; pH - 5.5; S. Gravity 1.090

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	160	variable	sand, gravel	fresh

4. Mineral Resources in Area: Small amounts of peat and marl are recovered commercially in the area of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste effluent from metals products operation waste pickle liquor. 8.5% H_2SO_4, 13% Fe SO_4, 0.5% HCl, 17.4% $FeCl_2$.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: 1.1 to 1.2
   E. pH: N/A

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Filtration to 0.6 microns

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	H-40	16	
Intermediate	13-5/8	J-55	10-3/4	2440
Injection			2-7/8	2550
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Open hole completion

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 2,000 gal. mca (acid)

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 2 - 100,000 gal. storage tanks
   1 - 20,000 gal. storage tank

2. **Filters:** 2 percent filters

WIC IN-11

3. Pumps: 2 - 150 gpm booster pumps
2 - 150 gpm injection pumps

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Overall	Average	55	Maximum	110
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	0	Maximum	230
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: IN-12

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Indiana General Corporation
405 Elm Street - Valparaiso, Indiana 46383

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) (Month) 04 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 16, T35N, R5W
4. County: Porter State: Indiana
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Ammonium chloride waste from the manufacture of iron oxide from pickle liquor.
2. Date Well Permitted: 10/70 Completed:
3. Injection Rate: 1972; 2,505,466 est. 1973; 7,000,000 gals.
4. Injection Pressure: 0
5. Total Depth of Well: 4548
6. Name, Age, and Depth of Injection Zone: Mt. Simon, Cambrian, 2815
7. Date Injection Began: (Day) (Month) 10 (Year) 70
8. Total Volume Injected to Date: 8,134,131 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Silurian		923	208	
Cincinnatian	Ordovician	1131	266	shale
Trenton	Ordovician	1397	101	limestone
Black River	Ordovician	1498	400	limestone
Knox	Cambrian	1898	917	dolomite, shale
Eau Claire	Cambrian	2815	1733	shale
Mt. Simon	Cambrian	4548		sandstone
	Pre-Cambrian			crystalline basement

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Mt. Simon	
(2) Depth (Ft.)	2815	
(3) Thickness (Ft.)	1733	
(4) Formation Fluid Pressure, psi	.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Cambrian	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Sandstone	

C. Chemical Characteristics of Formation Fluids: High saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	190	variable	sand, clay	fresh

4. Mineral Resources in Area: Peat is mined commercially on a small scale.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Ammonia chloride waste from the manufacture of iron oxide from pickle liquor

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 0
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: 70° to 120°F
   E. pH: 7.0 to 9.5

WIC IN-12

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Highly corrosive to most commercial metals.

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Filtration and sedimentation

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20		16	313
Intermediate	13-3/4		10-3/4	609
	9-5/8		7	2514
Injection		Fibercast	2-7/8	2598
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Oil in annulus

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 7,000 gal. holding tank

2. Filters: Three rotary leaf pressure filters

WIC IN-12

3. Pumps: 10 hr.-50 gpm

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average 50	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average 0	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 1972 2,505,466 B. 1971 3,592,545 C. 1970 209,812

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Conductivity bridge in annulus

B. Sampling Frequency and Water Quality Parameters Measured: Daily rate of flow, total daily flow, temp. pH, concentration, injection pressure and annulus pressure.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: Monthly report to Indiana stream pollution control board

C. Restrictions of Operation Procedures: N/A

Well Id. Code: IN-13

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: General Electric
Mt. Vernon, Indiana 47620

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day)____ (Month) 04 (Year) 74
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 19, T7S, R13W, 1113.76 ft., FNL and 1.1 ft. FWL of NW 1/4 of NW 1/4 of Sec. 19
4. County: Posey State: Indiana
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted:____ Completed: 11/29/71
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 7980 plugged back to about 2800
6. Name, Age, and Depth of Injection Zone: St. Peter and Knox, Ordovician; Bethel, Mississippian, 2760
7. Date Injection Began: (Day) N/A (Month)____ (Year)____
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month)____ (Year)____
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
St. Genevieve	Mississippian	2944	66	limestone
New Albany	Mississippian	4585	305	shale
Louisville	Silurian	5960	100	limestone
Brassfield	Silurian	6290	105	limestone
Trenton	Ordovician	6750	750	dolomite, shale
Black River	Ordovician	7500	262	limestone w/inter shale
St. Peter	Ordovician	7762	115	sandstone
Knox	Ordovician	7877		dolomite

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit		Confining Bed
(1) Name	St. Peter	Knox	
(2) Depth (Ft.)	7762	7877	200
(3) Thickness (Ft.)	115		2500
(4) Formation Fluid Pressure, psi			
(5) Lithostatic Pressure, psi			
(6) Hydrofracturing Pressure, psi			
(7) Age of Unit	Ordovician		Pennsylvanian & Miss.
(8) Porosity %			
(9) Permeability, millidarcies			
(10) Reservoir Temperature, °C			
(11) Character and Areal Distribution	sandstone, dolomite extensive		shale, sandstone, and carbonates, ext.

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chloride - 2,600 ppm; sulfate 117 ppm; iron 0.3 ppm.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

3. Toxicity: None - high pH may be reduced through dilution and reactions after injection.

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC IN-13

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Volume/pressure monitor.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: Monthly reports to state.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KS-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Vulcan Materials Company

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** N/A **(Month)** **(Year)**
2. **Latitude and Longitude:** 37°32'40"/97°27'15"
3. **Well Location (Legal Description):** Sec. 7 - T29S - R1W
4. **County:** Sedgwick **State:** Kansas
5. **SIC Classification:** 1321

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Wastes from the production of chlorine, sodium hydroxide, and related products from brines.
2. **Date Well Permitted:** 1952 **Completed:**
3. **Injection Rate:** 225 gpm
4. **Injection Pressure:** Gravity
5. **Total Depth of Well:** 400 ft.
6. **Name, Age, and Depth of Injection Zone:** Wellington, Permian, 240
7. **Date Injection Began: (Day)** **(Month)** **(Year)** 1952
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wellington	Permian	240	82	Halite

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Wellington	
(2)	Depth (Ft.)	240	
(3)	Thickness (Ft.)	82	
(4)	Formation Fluid Pressure, psi		
(5)	Lithostatic Pressure, psi		
(6)	Hydrofracturing Pressure, psi		
(7)	Age of Unit	Permian	
(8)	Porosity %		
(9)	Permeability, millidarcies		
(10)	Reservoir Temperature, °C		
(11)	Character and Areal Distribution	Salt	

C. Chemical Characteristics of Formation Fluids: Saturated brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: Highly saline natural brines are obtained locally for chemical production.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste from the production of chlorine, sodium hydroxide, and related brines.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** Slight, if any, ingestion probably inhibited by brine

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal due to lack of substrate

7. **Pre-injection Waste Treatment:** Settling

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection			8-5/8	240
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 138 sks cemented to surface.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** N/A

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Brick lined holding basin

2. **Filters:** N/A

WIC KS-1

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average	225	Maximum	350
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	Gravity	Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KS-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: NO-UP

Operating Company Name and Address: Vulcan Materials Company

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) (Month) 12 (Year) 72
2. Latitude and Longitude: 37°35'0"/97°25'17"
3. Well Location (Legal Description): 810 ft. from the north line and 1200 ft. from the west line of SW 1/4 of Sec. 27, 28, R1W
4. County: Sedgwick State: Kansas
5. SIC Classification: 1312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Unsaturated Ca and Mg brine solutions, impure bromide, chlorinated organics, and hydrochloric acid.
2. Date Well Permitted: 5/17/61 Completed:
3. Injection Rate: 350
4. Injection Pressure: Gravity
5. Total Depth of Well: 4125
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician, 3927
7. Date Injection Began: (Day) (Month) 05 (Year) 61
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) 12 (Year) 72
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

WIC KS-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	3927	
(3) Thickness (Ft.)	198	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Ordovician	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone dolomite	

C. Chemical Characteristics of Formation Fluids: Highly mineralized - 150,000 mg/l

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: Oil and gas are produced in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: 120F
   E. pH: 1 to 9

WIC KS-2

3. **Toxicity:** Possible contamination of water by chlorinated hydrocarbons (organics)

4. **Reactivity with Surface Equipment Components:** Probably none

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	3.42 #/ft.	10-3/4	395
Intermediate	9	26 #/ft. plastic coated	7	2965
	9	26 #/ft. uncoated	7	2965-4125
Injection	9	TE-300 heavy duty	4-1/2	4125
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 casing - 800 sks Pozmix - 7" casing - 1500 gal. Cealme

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** A centralizer is located immediately above the perforated zone.

5. **Bottom Hole Completion:** Perforations - 3990-4115 ft. - 4 jet shots per ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 6150 gal. HCL

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 407,000 gal. holding pond and surface drainage of rainfall through a 6 inch reinforced polyethelene pipe; two automatic throttling valves govern the flow of waste from a sump to the well.

2. **Filters:** N/A

WIC KS-2

3. Pumps: 10'W x 50'L x 14'D sump with 51,360 gal. capacity.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average 350	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average 27 mm of Hg	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KS-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Northern Natural Gas Company
P.O. Box 47 - Mullinville Compressor Station
Mullinville, Kansas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) (Month) 12 (Year) 72
2. Latitude and Longitude: 37° 35' 38"/99° 24' 34"
3. Well Location (Legal Description): SE 1/4, Sec. 20, T28, R19W
4. County: Kiowa State: Kansas
5. SIC Classification: 1321

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Brine solution, blow down water from cooling tower, engine jacket water overflow from gas engines, regeneration water from refinite water softener.
2. Date Well Permitted: 5/12/52 Completed:
3. Injection Rate: 130,000 gpd
4. Injection Pressure: Gravity
5. Total Depth of Well: 5775
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician 5500 - 5700
7. Date Injection Began: (Day) (Month) (Year) 1954
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Heebner	Pennsylvanian	4130	25	shale
Lansing	Pennsylvanian	4305	75	shale, limestone
Marmaton	Pennsylvanian	4730	200	shale, limestone
Mississippian	Mississippian	4912	430	limestone
Viola	Ordovician	5342	132	limestone
Simpson	Ordovician	5474	21	shale, limestone, sandstone
Arbuckle	Ordovician	5494		dolomite

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	5500	
(3) Thickness (Ft.)	200	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Ordovician	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	46°	
(11) Character and Areal Distribution	Dolomitic limestone Statewide	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Brine, blow down water, water softener regeneration

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

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3. **Toxicity:** Probably none, ingestion inhibited by brine taste.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	48 #/ft.	13-3/8	446
Intermediate	8-3/8	23 #/ft.	7	5510
Injection	6-1/4		4-1/2	5500
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8 casing - 400 sks cement - 7 casing - 500 sks cement.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Everseal hook wall packer - Kerosene between 7" and 4-1/2" tubing.

5. **Bottom Hole Completion:** Open 5500-5700 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Retention pond 80,000 sq. ft. - average depth- 3-3/4 ft.

2. **Filters:** N/A

3. **Pumps:** 3" CMC, 20M Centrigugal water pump Model FC 3-15 direct connected to L-A Electric Motor 440 volt, 5-1/2 HP., 2 speed.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: Rice Engineering and Operating Inc., 1020 Hoover, Great Bend, Ks. inspects operation of well every 2 months.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Formation with an open hole (by gravity). The well is so cased and cemented as to allow none of the mineralized water to rise and contact any of the upper fresh water strata.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KS-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: American Salt Co.
P.O. Box 498 - Lyons, Kansas 67554

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) ____ (Month) 12 (Year) 72
2. Latitude and Longitude: 38°18'25"/98°11'17"
3. Well Location (Legal Description): SE 1/4, Sec., 15, T15S, R6W
4. County: Rice State: Kansas
5. SIC Classification: 1499

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Disposal of brine from hydraulic salt mining and processing operations.
2. Date Well Permitted: 2/12/68 Completed: ____
3. Injection Rate: 330,000 gpd
4. Injection Pressure: Gravity
5. Total Depth of Well: 3800
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician, 3501
7. Date Injection Began: (Day) ____ (Month) ____ (Year) 68
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) ____ (Year) ____
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

B. **Geologic Description of Injection Unit and Other Possible Units**

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	3501	200
(3) Thickness (Ft.)	300	3300
(4) Formation Fluid Pressure, psi	0.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Ordovician	Permian-Ordovician
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite & limestone regionally distr.	shale, carbonates, evaporites, & ss., widespread

C. **Chemical Characteristics of Formation Fluids:** Saline

3. **Geohydrology of Fresh Water and Other Useful Aquifers**

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. **Mineral Resources in Area:** Salt

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** N/A

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** Sodium brine solution.

2. **Physical/Chemical Description**
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC KS-4

3. Toxicity: Probably minimal; ingestion prohibited by brine taste.

4. Reactivity with Surface Equipment Components: Possible corrosion of metallic components by brine.

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) Average Maximum
"
"
"

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) Average Maximum
"
"
"

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: KS-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** NO-UP

Operating Company Name and Address: Skelly Oil Company - Kan. Pipe Line Div.
Bunton, Kansas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 15 **(Month)** 02 **(Year)** 73
2. **Latitude and Longitude:** 38°00'07"/97°38'39"
3. **Well Location (Legal Description):** SW1/4, Sec. 34, T23S, R3W
4. **County:** Harvey **State:** Kansas
5. **SIC Classification:** 1311

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Salt water from Crude Oil stream zeolite softener
2. **Date Well Permitted:** 7/22/68 **Completed:**
3. **Injection Rate:** 267,000 GPY
4. **Injection Pressure:** 350 psi
5. **Total Depth of Well:** 937 ft.
6. **Name, Age, and Depth of Injection Zone:** Wellington, 486
7. **Date Injection Began: (Day)** 22 **(Month)** 07 **(Year)** 58
8. **Total Volume Injected to Date:** 598,000 **(Gallons)**
9. **Date Injection Ceased: (Day)** 06 **(Month)** 10 **(Year)** 64
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wellington		486	451	

(a)

WIC KS-5

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Wellington	
(2) Depth (Ft.)	913	
(3) Thickness (Ft.)	24	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: Salt beds, Crude Oil

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Salt water from zeolite softener.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC KS-5

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	Grade B	8-5/8	278.63
Intermediate	7-7/8	Seamless	5-1/2	913.91
Injection		Tubing - seamless	2-3/8	915
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 5-1/2 casing - 200 sacks cement. 8-5/8 inch casing - 200 sacks cement. 2-3/8 tubing - 60 sacks cement.

3. **Well Head Equipment (Name and Models):** 5-1/2 x 2" Larkin Tubing Head

4. **Packers, Centralizers, and Other Subsurface Equipment:** Halliburton 5-1/2" Packer Shoe and 5-1/2" Baffel Ring.

5. **Bottom Hole Completion:** Packer at 913 ft. 2' of 2-3/8" tubing extends below packer into formation.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 500 gal. of 7.5% solution Hydrochloric Acid - 2000 gal. of 15% solution Hydrochloric Acid.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 250 bbl brine holding tank

2. **Filters:** N/A

WIC KS-5

3. Pumps: High pressure pump - 10 BPH at 350 PSI, powered by 5 H.P. electric motor.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average	7	Maximum	7
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	350	Maximum	350
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KS-6

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Morton Salt Company
P.O. Box 1547 - Hutchinson, Kansas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 01 (Year) 73
2. Latitude and Longitude: 38°02'03"/98°57'40"
3. Well Location (Legal Description): NE 1/4, SE 1/4, Sec 22, T23S, R6W
4. County: Reno State: Kansas
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Hydraulic salt mining wastes
2. Date Well Permitted: 12/6/67 Completed:
3. Injection Rate: 205,479 gpd
4. Injection Pressure: 20" Hg vacuum
5. Total Depth of Well: 4405 ft.
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician
   4200 ft.
7. Date Injection Began: (Day) (Month) 03 (Year) 68
8. Total Volume Injected to Date: 300,000,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Abandoned brine well cavities.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	Wellington-Simpson
(2) Depth (Ft.)	4200	500
(3) Thickness (Ft.)	500	3700
(4) Formation Fluid Pressure, psi	1420	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Ordovician	Permian-Ordovician
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite, limestone regional	shale, evaporites, limestone, sandstone regional

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Salt

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Several abandoned and plugged salt brine production wells in the area.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Near saturated salt brine containing sulfates, carbonates, phosphates, calcium, and magnesium.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 10
   B. Conc. Dissolved Solids, mg/l: 250,000
   C. Specific Gravity: 1.2
   D. Temperature: 68 - 81° F
   E. pH: 7.5 - 8.5

WIC KS-6

3. **Toxicity:** Probably minimal; ingestion inhibited by brine taste

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metallic components by brine.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Settled, filtered (150 micron), and clarified through old brine well cavities

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate		J-55	8-5/8	850
Injection		J-55	5-1/2	4400
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** Surface - 300 sks. Posmix 4% Gel., 100 sks salt sat., 50 sks. Comm. injection - 150 cu. ft. Pozmix salt saturated.

3. **Well Head Equipment (Name and Models):** 5-1/2" x 8-5/8" Braden Head.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker Filler Collar Triplex cement control shoe - (3) Halliburton Centralizers (2) Halliburton Baskets.

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized well at start-up to remove drilling mud from formation. Used 4000 gal. of 12% HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 300,000 gal. holding tank (Cement at grade) - Steel 120,000 gal. mixing tank - 3,000' 4" transite line.

2. **Filters:** 150 Micron cartridge filter at well head.

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	3/68 - 6/72	Average	100	Maximum	
"	6/72 - present		130		
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	3/68 - 6/72	Average	10" Hg	Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 1972 75,000,000 B. 1971 50,000,000 C. 1970 50,000,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure gauge on injection. Annulus space packed with fuel oil #2 and pressure gauge.

B. Sampling Frequency and Water Quality Parameters Measured: Saturation, temperature, and pH - weekly

C. Frequency of Measuring Water Levels and Hydrostatic Heads: weekly

2. Contingency Plan for Well Failure During Operation: Holding tank

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KS-7

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Derby Refining Company
1100 East 21st., - Wichita, Kansas 67219

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) (Month) 12 (Year) 72
2. Latitude and Longitude: 37°43'38"/97°19'22"
3. Well Location (Legal Description): 675 ft. from south line; 865 ft. from east line, Sec. 4, T27S, RIE - directional hole
4. County: Sedgwick State: Kansas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Initially disposal of spent caustic from refinery operation; since early 1959 only disposal of oil field brine.
2. Date Well Permitted: 12/14/56 Completed:
3. Injection Rate: 189 gpm
4. Injection Pressure: Gravity
5. Total Depth of Well: 4204 (directional hole TVD 3899)
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician, 3415
7. Date Injection Began: (Day) (Month) (Year) 57
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Lansing	Pennsylvanian	2515	466	ls - sh
	Mississippian	2981	436	ls
Viola	Ordovician	3317	35	dolomite
Simpson	Ordovician	3352	63	ss - sh
Arbuckle	Ordovician	3415		dolomite

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	3415	
(3) Thickness (Ft.)	484	3000 est.
(4) Formation Fluid Pressure, psi	1300	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Ordovician	Penn.-Ordovician
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Blanket porous Dolomite	shale, ls., & ss.

C. Chemical Characteristics of Formation Fluids: Salt water

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: Located on west side of an oil field which produces from Lansing, Viola, and Simpson Formations.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Salt brine; original input was spent caustic from refinery operations mixed with oil field brine; presently only oil field brine (Source - Viola Formation)
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

3. Toxicity: Minimal, if any; ingestion prohibited by brine taste.

4. Reactivity with Surface Equipment Components: Possible corrosion of metallic components by brine.

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-3/4	32.75# H-40	10-3/4	399
Intermediate				
Injection	9	32# J-55	7	3750
Other	9	open hole	9	4204
		EUE J-55 tubing, cement	3	1300 (length)

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 275 sks Pozmix: 7 inch casing - 750 sks Pozmix plus 50 sks common.

3. Well Head Equipment (Name and Models): 10-3/4" x 7" YLS Norris w/2 inch outlets; tubing head - 3" x 7" Norris.

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 15% mud acid and 15% MCA.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 1 - 300 bbl 16' x 10' redwood tank with 2.inch bottom and deck and 3 inch stoves; 240 ft. 3 inch LOC Plastic Pipe: 36 ft. 3 inch Transite.

2. Filters: N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	12/57	Average	94.5	before acid
"	12/57		94.5	after acid
"	12/61		189	after cleanout
"				

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	Gravity	Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KS-8

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN

Operating Company Name and Address: Mid-America Pipeline Systems, Div. MAPCO
P.O. Box 976, Liberal, Kansas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 12 (Year) 72
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): SW 1/4, Sec 24, T19S, R5W
4. County: McPherson State: Kansas
5. SIC Classification: 1321

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Saturated sodium brine solution resulting from solutioning of salt zone to develop storage "jugs."
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 0.46 - 1.4 million gpd
4. Injection Pressure: 26" vacuum to 5 psig
5. Total Depth of Well: 4290 ft.
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician 4003 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Mississippian	Mississippian	3408	226	
Kinderhook	Mississippian	3636	258	
Viola	Mississippian	3894	38	
Simpson	Ordovician	3932	71	
Arbuckle	Ordovician	4003		

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	Wellington-Simpson
(2) Depth (Ft.)	3994	500
(3) Thickness (Ft.)	296	3500
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est	
(7) Age of Unit	Ordovician	Permian-Ordovician
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	44°	
(11) Character and Areal Distribution	limestone widespread	shale, evaporites limestone, sandstone widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Saturated sodium brine.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: Minimal

4. Reactivity with Surface Equipment Components: Possible corrosion of metallic components by brine

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	10-3/4		10-3/4	158
Intermediate			7-5/8	4011
Injection		Lined tubing	5-1/2	2000
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 7-5/8" casing cemented from top of Arbuckle to surface (845 sks) 10-3/4" casing - 70 sks

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Oil between 5-1/2 and 7-5/8 inch casing.

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: Periocic acid wash - 3 to 4 years.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 300,000 barrel lined pit.

2. Filters: None

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3. Pumps: 2- Worthington Vertical 3 stg w/ 125 H.P. - electric
1- Layne Bowler Vertical 5 slg w/ 125 H.P. - electric

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KS-9

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Colorado Interstate Gas Co.
P.O. Box 1087 - Colorado Springs, Colorado

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) ____ (Month) 12 (Year) 72
2. Latitude and Longitude: 37°11'30"/102°01'30"
3. Well Location (Legal Description): NE 1/4, Sec. 18, T33N, R43W
4. County: Morton State: Kansas
5. SIC Classification: 1839

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Cooling tower - dealkolizer
2. Date Well Permitted: 12/16/57 Completed: ____
3. Injection Rate: 4000 - 8000 gpd
4. Injection Pressure: Gravity
5. Total Depth of Well: 1272
6. Name, Age, and Depth of Injection Zone: Glorietta Sandstone, Permian, 1065-1100
7. Date Injection Began: (Day) ____ (Month) ____ (Year) 67
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) ____ (Year) ____
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Alluvium		0	30	
Sand		30	45	
Sand & Clay		75	29	
Dakota Sand	Cretaceous	104	186	sand
Morrison	Jurassic		290	undifferentiated
Dockum	Permian			undifferentiated
Quartermaster	Permian			
Day Creek	Permian			dolomite
Blaine	Permian		175	anhydrite
Glorietta	Permian	1065	160	sand stone
Clearfork	Permian	1225		anhydrite

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Glorietta	Blaine-Dakota
(2) Depth (Ft.)	1065	104
(3) Thickness (Ft.)	160	900
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Permian	Permian-Cretaceous
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	33°	
(11) Character and Areal Distribution	sandstone widespread blanket	sandstone, dolomite, anhydrite

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala				sand, gravel	fresh

4. Mineral Resources in Area: Extensive oil and gas resources occur in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Brine solution and rinse water.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 6.6

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Chlorination

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection	6-3/4	9.5# J-55	4-1/2	1270
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 4-1/2 inch casing - 275 sks Halliburton cement.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** N/A

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidize every three years.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Retention pond - 13700 sq. ft. stabilization ponds (2).

2. **Filters:** N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ __________ B. 19__ __________ C. 19__ __________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: KS-10

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Farmland Industries, Inc.
Dodge City, Kansas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** **(Month)** 12 **(Year)** 72
2. **Latitude and Longitude:** 37°46'24"/99°55'00"
3. **Well Location (Legal Description):** Center of north half, SW 1/4, NE 1/4, Sec. 22, T26S, R24E, Ford County, Kansas
4. **County:** Ford **State:** Kansas
5. **SIC Classification:** 2871

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Process water containing nitrate and ammonia - 4,000 bbls per day average.
2. **Date Well Permitted:** 1/25/68 **Completed:**
3. **Injection Rate:** 0 - 300 gpm
4. **Injection Pressure:** Gravity
5. **Total Depth of Well:** 6507
6. **Name, Age, and Depth of Injection Zone:** Arbuckle, Ordovician, 5820
7. **Date Injection Began: (Day)** **(Month)** **(Year)** 68
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Used for irrigation.

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Topeka	Pennsylvanian	3792	425	limestone and shale
Lansing	Pennsylvanian	4329	390	limestone and shale
Marmation	Pennsylvanian	4720	153	limestone and shale
	Pennsylvanian	4987	75	porous ss, with oil shows
Warsaw	Mississippian	5232	54	chert, dolomite & limestone
Osage	Mississippian	5302	234	chert, dolomite & limestone
Kinderhook	Mississippian	5540	139	limestone, chert & shale
Viola	Ordovician	5679	87	dolomite, chert & shale

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	5820	500
(3) Thickness (Ft.)	687	5000
(4) Formation Fluid Pressure, psi	2000	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Ordovician	Permian-Ordovician
(8) Porosity %	15	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	54°	
(11) Character and Areal Distribution	Dolomitic limestone	shale, carbonates, ls., & ss., widespread

C. Chemical Characteristics of Formation Fluids: Saline and contains H_2S

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	1500	variable	sandstone	fresh

4. Mineral Resources in Area: Oil

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cooling tower blow down and condensate, has traces of chromate, ammonia, and H_2SO_4

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

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3. **Toxicity:** Nitrate accepted, limit in drinking water 50 mg/1 excess nitrate causes infant methemoglobinia; accepted limits of ammonia in drinking water 0.05-0.5 mg/1.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Treated with lime and SO_2 gas to precipitate contaminates. Con densate stripped to only a few ppm ammonia.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	24# J-55	8-5/8	1654
Intermediate				
Injection	7-7/8	15# J-55	5-1/2	5835
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing - 550 sks cement; 5-1/2 inch casing - 125 sks cement.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Shoe at 1640 ft; pack-off stone at 5835 ft; centralizers on 8-5/8 inch casing: 1604, 1634 ft., 5-1/2 inch casing - 5820, 5727, 5633, 5097 ft.

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized with acid mud.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Retention storage ponds for irrigation when possible; 2 - 34,400,000 and 24,000,000 gal. ponds.

2. **Filters:** N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: KS-12

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: Mobil Oil Corporation - Spivey Gasoline Plant
Harper County, Kansas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) N/A (Month) (Year)
2. Latitude and Longitude: 37°23'00"/98°12'45"
3. Well Location (Legal Description): 350 ft. FEL + 1220 ft. FSL of SW 1/4, Sec. 5, T31S, R8W
4. County: Harper State: Kansas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Cooling water and sodium brine solution from regeneration of water softener.
2. Date Well Permitted: 6/24/57 Completed:
3. Injection Rate: 16,200 GPD
4. Injection Pressure: 350 psi
5. Total Depth of Well: 5400 ft.
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician, 4902
7. Date Injection Began: (Day) (Month) (Year) 56
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
		0	1900	redbed, shale, lime, sand
		1900	1749	lime w/shale breaks
Lansing-Kansas City		3649	769	limestone
Mississippian	Mississippian	4418	158	lime, cherts
Kinderhook	Mississippian	4260	458	limestone, cherts
Viola	Ordovician	4718	56	limestone
Simpson	Ordovician	4774	128	sandstone
Arbuckle	Ordovician	4902	498	dolomite

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	4950	
(3) Thickness (Ft.)	450 (open hole)	
(4) Formation Fluid Pressure, psi	1100	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Ordovician	
(8) Porosity %	14.4	
(9) Permeability, millidarcies	131	
(10) Reservoir Temperature, °C	49°	
(11) Character and Areal Distribution	blanket deposition of gray, cherty, crystalline, dolomite	

C. Chemical Characteristics of Formation Fluids: High salt content brine water with approximately 145,000 ppm solid content.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	75 to 100	variable	sands	potable

4. Mineral Resources in Area: Oil and gas from 3500 ft. to Arbuckle formation.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Gasoline plant wastes.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: 6.0

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	48# H-40	13-3/8	209
Intermediate	12-1/4	32.8# H-40	9-5/8	1065
	8-3/8		7	4950
Injection		tubing	3	4002
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - 250 sks cement; 9-5/8 inch casing - 100 sks cement; 7 inch casing - 1200 sks cement.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Packer set at 4002 ft.

5. Bottom Hole Completion: Open hole 4950-5400 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized-injection formation.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 1 - 40 ft. x 50 ft. x 5 ft. - oil skimmer P.T.; 1 - 40 ft. x 50 ft. x 8 ft. - clear water pit.

2. Filters: N/A

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3. Pumps: 2 - electric deep well type, max. discharge pressure 290 psi.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: Maximum injection pressure is limited to 250 psi.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KS-13

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Mobile Oil Corp. - Spivey Gasoline Plant

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) N/A (Month) (Year)
2. Latitude and Longitude: 37°23'08"/98°13'30"
3. Well Location (Legal Description): 990' FWL, 330' FSL SW/4 SW/4 Sec. 5, T31S, R8W
4. County: Harper State: Kansas
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Cooling water and sodium brine solution from regeneration of water softener.
2. Date Well Permitted: 12/23/69 Completed:
3. Injection Rate: N/A
4. Injection Pressure: 150 psi
5. Total Depth of Well: TD 5400 PBTD 5340 ft.
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician, 4950-5400
7. Date Injection Began: (Day) 23 (Month) 12 (Year) 69
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
		0	1900	redbed, shale, sand
		1900	1749	limestone w/shale
Lansing-Kansas City		3649	769	limestone
Mississippian	Mississippian	4418	158	limestone, chert
Kinderhook	Mississippian	4260	458	limestone, chert
Viola	Ordovician	4718	56	limestone
Simpson	Ordovician	4774	128	sandstone
Arbuckle	Ordovician	4902	498	dolomite

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	4950	
(3) Thickness (Ft.)	450	
(4) Formation Fluid Pressure, psi	1100	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Ordovician	
(8) Porosity %	14.4	
(9) Permeability, millidarcies	131	
(10) Reservoir Temperature, °C	49°	
(11) Character and Areal Distribution	gray, cherty dolomite	

C. Chemical Characteristics of Formation Fluids: High salt content brine water with approximately 145,000 ppm solid content.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	100	variable	sands	potable

4. Mineral Resources in Area: Oil and gas from 3500 ft. to Arbuckle formation.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Nearest freshwater use 1/4 mile from well site (except plant well - 100 yds.)

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Gasoline wastes.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 6.0

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: API oil-water separator, 500 bbl. redwood tank.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		H-40	9-5/8	219
Intermediate		15.5# J-55	5-1/2	4508
Injection		liner	2	4900
Other		liner-4" Hydril FJ@11#/FT-JSS	4"	4400-4950

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Dowell inhibitor A-130 packer set at 4196 on 2" casing; packer hanger set on 4' liner.

5. Bottom Hole Completion: Open hole 4950-5400

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidize formation face once a year.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 1 - 40' x 50' x 5' oil skimmer pit, 1 - 40' x 50' x 8' clear water pit.

2. Filters: N/A

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3. Pumps: 2 - electric deep well type - maximum discharge pressure 290#

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Maximum injection presure - 1000 psi.

Well Id. Code: KS-14

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Northern Natural Gas Pipeline Company
Bushton Compressor - Bushton, Kansas

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 19 (Month) 02 (Year) 54
2. Latitude and Longitude: 38°31'02"/98°21'17"
3. Well Location (Legal Description): NE 1/4, Sec. 6, T18S, T9W, Rice County, Kansas
4. County: Rice State: Kansas
5. SIC Classification: 1389

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Brine solution from backwashing of a zeolite water softening unit.
2. Date Well Permitted: 7/9/52 Completed:
3. Injection Rate: 2.2 million gals.
4. Injection Pressure: Vacuum
5. Total Depth of Well: 3413 ft.
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician, 3,304 - 3413
7. Date Injection Began: (Day) 19 (Month) 02 (Year) 54
8. Total Volume Injected to Date: 144,592,560 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Anhydrate		450	470	Anhydrate
Wellington		920	280	Shale
Fort Riley		1200	395	
Florence Flint		1595	40	Shale
Arbuckle	Ordovician	3304	109	Dolomite

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	3,304	
(3) Thickness (Ft.)	109	
(4) Formation Fluid Pressure, psi	0.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Ordovician	
(8) Porosity %	5-8	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	Cream buff, fine Crystalline, slightly oolitic dolomite	

C. Chemical Characteristics of Formation Fluids: Brine solution.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Removal of chromium and pH adjustment

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			8-5/8	950
Intermediate		14# Seamless	5-1/2	3304
Injection		Cement lined tubing	3-1/2	3304
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Kerocene used as corrosion inhibitor

5. Bottom Hole Completion: 109 ft. of Open Hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Small concrete holding pit siphon from pit to well bore to exclude air.

2. Filters: N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
	Gravity	
"		
"		
"		

3. Annual Volume Injected, gal.
A. 1972 2.2 million B. 1971 7.9 million C. 1970 7.9 million

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: 2 observation wells

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KS-15

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Northern Natural Gas Co.
2223 Dodge St. - Omaha, Nebraska 68102

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 13 (Month) 02 (Year) 73
2. Latitude and Longitude: 37°17'50"/100°52'00"
3. Well Location (Legal Description): NW 1/4 Sec. 1, T32S, R33W 1320' from North line and 1320 ft. from the West line.
4. County: Seward State: Kansas
5. SIC Classification: 1389

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Natural gas compressor station.
2. Date Well Permitted: 1968 Completed:
3. Injection Rate: 18,500 gpd
4. Injection Pressure: Vacuum
5. Total Depth of Well: 4300'
6. Name, Age, and Depth of Injection Zone: Topeka, Pennsylvania, 3400 - 4000
7. Date Injection Began: (Day) 12 (Month) 06 (Year) 68
8. Total Volume Injected to Date: 31,800,818 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Pumped to Cimarron River

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Ogallala	Tertiary	0	500	
Dakota	Cretaceous	500	640	sandstone
Stone Corral	Permian	640	3000	
Council Grove	Permian	3000	3400	
Tarkio	Pennsylvanian	3400		limestone
Burlingame	Pennsylvanian			limestone
Topeka	Pennsylvanian			limestone
Toronto	Pennsylvanian			limestone

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Topeka	
(2) Depth (Ft.)	3400	700
(3) Thickness (Ft.)	1250	3300
(4) Formation Fluid Pressure, psi	0.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Pennsylvanian	Permian-Pennsylvanian
(8) Porosity %	5-10	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone, widespread	shale, evaporite, limestone, & ss.

C. Chemical Characteristics of Formation Fluids: 13,500 ppm chloride

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Dakota	700				potable

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Well water concentrated 4 to 5 times from evaporation. Treated with H_2SO_4 and chromate for scale and corrosion control. Slight oil contamination.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: 2500 to 3500
   - C. Specific Gravity: 1.0
   - D. Temperature: 80°F
   - E. pH: 7 to 8.5

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection:
N/A

7. Pre-Injection Waste Treatment: Gravity type oil separator and filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		J-55 24#/ft.	8-5/8	595
Intermediate		J-55 15.5#/ft.	5-1/2	4295
Injection		J-55 4.6#/ft.	2 3/8	3720
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 8-5/8 inch casing - 305 sks (595' cement); 5-1/2 inch casing - 765 sks (1995 ft. cement)

3. Well Head Equipment (Name and Models): Filter - Crall Products, Inc. Model 8-4 - with 100 Micron Elements.

4. Packers, Centralizers, and Other Subsurface Equipment: Packer set at 3720' biocide treated, non-corrosive fluid between casing and tubing.

5. Bottom Hole Completion: Perforations - 4028-4058 and 4148-4173. (two holes per foot)

6. Hydraulic Fracturing, Acidizing Programs, etc.: 3000 gal. of 15% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 40'x40'x2' lagoon

2. Filters: N/A

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3. **Pumps:** 2 - pumps with 7.5 hp motors to pump water thru filter

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
1972	10.4	19.3
1971	15.1	22.9
1970	15.7	24.5
1969	19.5	36.0

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum

3. **Annual Volume Injected, gal.**
A. 1972 31,800,818 B. 1971 27,741,926 C. 1970 20,329,111

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** 3 wells located on plant site. (fresh water wells)

B. **Sampling Frequency and Water Quality Parameters Measured:** Samples from 3 wells once each quarter = 4/year

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Monthly

2. **Contingency Plan for Well Failure During Operation:** Divert waste water to lined evaporation pond.

3. **Regulatory Aspects**

A. **Construction Requirements:** N/A

B. **Monitoring Requirements:** Submit analyses of water produced from 3 fresh water wells.

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: KS-16

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Amoco Production Company
P.O. Box 432 - Liberal, Kansas

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** ______ **(Month)** ______ **(Year)** 72
2. **Latitude and Longitude:** 37°34'10"/101°29'40"
3. **Well Location (Legal Description):** NE 1/4, Sec. 5, T29S, R38W, Grant County McGannon Disposal Well No. 2 - 660' S of NL 1070' W of EL
4. **County:** Grant **State:** Kansas
5. **SIC Classification:** 1389

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** 3 cooling towers serving heat exchanges in hydrocarbon extraction plant.
2. **Date Well Permitted:** 4/8/58 **Completed:** ______
3. **Injection Rate:** N/A
4. **Injection Pressure:** Vacuum
5. **Total Depth of Well:** 3950
6. **Name, Age, and Depth of Injection Zone:** Virgilian Series, Pennsylvania, 3100
7. **Date Injection Began: (Day)** ______ **(Month)** ______ **(Year)** 58
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** ______ **(Year)** ______
10. **Previous Mode of Disposal:** Evaporative pond

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Ogallala	Tertiary	0	400	
	Cretaceous	400-460	60	
Cimmaron Salt	Pennsylvanian	1690	60	
Hugoton Gas Pay	Pennsylvanian	2388	212	
Council Grove Lime	Pennsylvanian	2730	160	
Topeka Lime	Pennsylvanian	3400	370	

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Virgilian Series	
(2) Depth (Ft.)	3100	465
(3) Thickness (Ft.)		3500
(4) Formation Fluid Pressure, psi	840	
(5) Lithostatic Pressure, psi	1.0 psi/ft.	
(6) Hydrofracturing Pressure, psi	1700 est.	
(7) Age of Unit	Pennsylvanian	Pennsylvanian
(8) Porosity %	12-16	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	30°	
(11) Character and Areal Distribution	limestone	shale

C. Chemical Characteristics of Formation Fluids: Not accurately determined only Topeka water sample obtained believed to be contaminated by filtrate during drilling operations, however, chlorides are at least 25,200 ppm and total solids are 44,600 ppm by analysis of available water samples.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Ogallala	400	60'	extensive	Coarse Sand	Excellent

4. Mineral Resources in Area: Gas production, brine production.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Two observation wells 1/4 mile west of well (450-460 ft. deep); two water supply wells 1000 ft. west 10° south of SWD (462+467 ft. deep).

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cooling water containing hexavalent chromium.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Filtered thru two Permatit filters.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	22.7# Armco SW	8-5/8	623
Intermediate				
Injection	7 7/8	9.5# J-55 SMLS	4-1/2	3939
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 8-5/8 inch casing - 500 sks cement; 4-1/2 inch casing - 1600 sks - DV tool @ 2116' 1000 sks cement.

3. **Well Head Equipment (Name and Models):** Well Head - 4-1/2" to 2-1/2" casing swage with 2'T.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Centralizers at 2081', 2179', 3024', 3468', 3597,' 3939'

5. **Bottom Hole Completion:** Original perforations 3514-24 ft, 3536-41 ft., 3803-13 ft. Reperforated 3516-19, 3538-40, 3564-68, 3750-52'

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized with 750 gal. 15% HCl; original hydraulic fracturing with 100,000 gallons water and 100,000# sand.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 10' x 12' dia. 200 barrel. - 2" injection line from holding tank to well.

2. **Filters:** 2 - 5' x 4' dia. Permutit filters packed with graded (#1-6) authra-filter bed tapped with performed floc composed of alum and soda ash.

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3. **Pumps:** 1 - Frank Wheatley P-300 triplex w/10 HP meter.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s) 5/5/58	**Average** 86.1	**Maximum**
"		
"		
"		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s) 5/5/58	**Average** 20" vacuum	**Maximum**
"		
"		
"		

3. **Annual Volume Injected, gal.**
A. 1972 468,000 B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** N/A

B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** Resume disposal in evaporative pond, if needed, on temporary basis.

3. **Regulatory Aspects**

A. **Construction Requirements:** Must protect Ogallala fresh water zone.

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** Limited to gravity injection.

Well Id. Code: KS-18

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Northern Natural Gas Company
2223 Dodge St. - Omaha, Nebraska

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 12 (Year) 72
2. Latitude and Longitude: 38°31'02"/98°21'17"
3. Well Location (Legal Description): NE 1/4, Sec. 6, T18S, T9W
4. County: Rice State: Kansas
5. SIC Classification: 1389

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Salt brine used to regenerate zeolite water softners. 33,000 gal. per regeneration averages 20 per month.
2. Date Well Permitted: 7/9/52 Completed:
3. Injection Rate: N/A
4. Injection Pressure: Vacuum
5. Total Depth of Well: 3414
6. Name, Age, and Depth of Injection Zone: Arbuckle, Ordovician, 3304-3413
7. Date Injection Began: (Day) 19 (Month) 02 (Year) 54
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Dakota	Cretaceous			sandstone
Kiowa				
Cheyenne				sandstone
Haper				sandstone
Anhydrite		450	470	anhydrite
Wellington		920	280	shale
Fort Riley		1200	395	
Florence Flint		1595	40	shale-shells
Arbuckle	Ordovician	3304	109	dolomite

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Arbuckle	
(2) Depth (Ft.)	3304	
(3) Thickness (Ft.)	109	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Ordovician	
(8) Porosity %	5-8	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	cream buff, fine	
	crystalline slightly	
	oolitic dolomite	

C. Chemical Characteristics of Formation Fluids: Brine solution.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 3.8 ppm hexavalent chromium

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: 8.4

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				950
Intermediate			8-5/8	950
Injection		#14 seamless	5-1/2	3304
Other				
		cement lines	3-1/2	3304

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Kerocene used as corrosion inhibitor

5. Bottom Hole Completion: 109 ft. open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Small concrete holding pit siphon from pit to well bore to exclude air.

2. Filters: N/A

WIC KS-18

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Two observation wells.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: KY-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP
Operating Company Name and Address: Sohio Petroleum Company
Latonia, Kentucky

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Carter coordinates 12-EE-60
4. County: Kenton State: Kentucky
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Caustic waste water.
2. Date Well Permitted: Completed: 1941
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 1011
6. Name, Age, and Depth of Injection Zone: St. Peter; Knox, Ordovician, 704-786
7. Date Injection Began: (Day) (Month) (Year) 48
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year) 62
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Oden	Ordovician	50	79	shale
Trenton	Ordovician	129	134	limestone
	Ordovician	263	441	shale and limestone
St. Peter	Ordovician	704	82	sandstone
Knox	Orodvician	786	225	dolomite

(a)

WIC KY-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit		Confining Bed
(1) Name	St. Peter	Knox	
(2) Depth (Ft.)	704	786	263
(3) Thickness (Ft.)	82	225	441
(4) Formation Fluid Pressure, psi			
(5) Lithostatic Pressure, psi			
(6) Hydrofracturing Pressure, psi			
(7) Age of Unit	Ordovician	Cam-Ord.	Ordovician
(8) Porosity %			
(9) Permeability, millidarcies			
(10) Reservoir Temperature, °C			
(11) Character and Areal Distribution	sandstone regional	dolomite regional	shale and limestone

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Caustic waste water

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC KY-1

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metallic components.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			13	78
Intermediate				
Injection			7	506
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 7 inch casing - 130 sks.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

WIC KY-1

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: KY-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: E.I. duPont de Nemours and Co., Inc.
Louisville, Kentucky 40501

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 20 (Month) 05 (Year) 73
2. Latitude and Longitude: 38°15'/86°50'
3. Well Location (Legal Description): Sec. 10
4. County: Jefferson State: Kentucky
5. SIC Classification: 2822, 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Aqueous hydrochloric acid solution having a maximum concentration of 20 wt.% (S.G. 1.106 9.16 lb/gal) at 140°F. The waste will not have more than 100 ppm "organics."
2. Date Well Permitted: Completed: 3/30/71
3. Injection Rate: 80,000,000 gpy
4. Injection Pressure: 5 PSIA at well head
5. Total Depth of Well: 6008' - plug back to 4500'
6. Name, Age, and Depth of Injection Zone: Knox, Ord.-Cam., 1710
7. Date Injection Began: (Day) 21 (Month) 02 (Year) 73
8. Total Volume Injected to Date: 10,225,000 (through 4/30/73) (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Acid sent to plant effluent water ditches thence to Ohio River.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Devonian	125-215	90	shale and limestone
	Silurian	215-370	155	shale, dolomite and limest.
	Ordovician	370-1010	640	shale, siltstone
Trenton	Ordovician	1010-1150	140	limestone
Black River	Ordovician	1150-1520	370	limestone
Chazyan	Ordovician	1520-1700	180	dolomite
St. Peter	Ordovician	1700-1710	10	sandstone
Knox Lower	Ordovician			
Upper	Cambrian	1710-4236	2526	dolomite
Eau Claire	Cambrian	4236-5088	264	dolomite and shale
Mt. Simon	Cambrian	5088-5950	862	sandstone and shale
	Pre-Cambrian	5950-6010	60	Serpentine

(a)

WIC KY-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Knox-Eau Claire	Trenton-Black River
(2) Depth (Ft.)	4500	1010
(3) Thickness (Ft.)	1502	700
(4) Formation Fluid Pressure, psi	1370	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Ord.-Cam.	Ordovician
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	23°-32°	
(11) Character and Areal Distribution	dolomite widespread	shale, widespread

C. Chemical Characteristics of Formation Fluids: TDS = 207,000 ppm; Ca = 25,000 ppm; Cl = 130,000 ppm; Na = 47,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 140,000 ppm NaCl; 25,000 ppm NaOH, 20,000 ppm sodium hypochlorite.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 1
   B. Conc. Dissolved Solids, mg/l: 146,000 - 160,000
   C. Specific Gravity: 1.106
   D. Temperature: 140°F
   E. pH: 1.0

WIC KY-2

3. **Toxicity:** HCl dissolved in water: corrosive to skin; HCl in equilibrium with solution is irritant and congestive to mucous membranes.

4. **Reactivity with Surface Equipment Components:** Corrosive acid

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** No BOD as such.

7. **Pre-injection Waste Treatment:** The wastes held in storage tanks, first: pumped through a rough precoat filter and then through a polishing filter (one micron detention).

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17	42#/ft. H-40	11-3/4	430
Intermediate	10-5/8	32#/ft. H-40	8-5/8	3100
		Hastelloy		3060-3070
Injection		Fiberglass	4-1/2	3060
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 300' - Halliburton EPSEAL, remainder - Common Cement.

3. **Well Head Equipment (Name and Models):** Grey Tool Company - CWC Flanged Well Head, 3000 psi working pressure.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Hastelloy Full Bore, 3060-3070 - Texas Iron Works

5. **Bottom Hole Completion:** Open hole 3100-4500

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Storage tanks.

2. **Filters:** Rough precoat filter and polishing filter

WIC KY-2

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	3/73	Average	60	Maximum	125
"	4/73		60		140
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	3/73	Average	3.5	Maximum	15
"	4/73		5.0		70
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous monitored waste injection flow pressure and flow. (Recorded) from 2760' monitor well is monitored to check strata above injection zone.

B. Sampling Frequency and Water Quality Parameters Measured: Wastes composition continuously monitored.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Well KY-3 is standby well for KY-2.

3. Regulatory Aspects

A. Construction Requirements: All satisfied.

B. Monitoring Requirements: Monitor well.

C. Restrictions of Operation Procedures: 80,000,000 gallons of waste per year.

Well Id. Code: KY-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: E.I. duPont de Nemours and Co., Inc.
Louisville, Kentucky 40501

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 20 **(Month)** 05 **(Year)** 73
2. **Latitude and Longitude:** 38°15'/86°50'
3. **Well Location (Legal Description):** Sec. 11
4. **County:** Jefferson **State:** Kentucky
5. **SIC Classification:** 2822, 2818

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Aqueous hydrochloric acid solution having a maximum concentration of 20 wt.% (S.G. 1.106 9.16 lb/gal) at 140°F. The waste will not have more than 100 ppm "organics."
2. **Date Well Permitted:** **Completed:** 3/30/71
3. **Injection Rate:** N/A
4. **Injection Pressure:** 5 psia at well head estimated.
5. **Total Depth of Well:** 4500
6. **Name, Age, and Depth of Injection Zone:** Knox Ord- Cam., 1716
7. **Date Injection Began: (Day)** N/A **(Month)** **(Year)**
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** Acid formerly sent to plant main effluent water stream which entered Ohio River.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Devonian	125-215	90	shale and limestone
	Silurian	215-370	155	shale, dolomite
	Ordovician	370-1010	640	shale, siltstone
Trenton	Ordovician	1010-1150	140	limestone
Black River	Ordovician	1150-1520	370	limestone
Chazyan	Ordovician	1520-1700	180	dolomite
St. Peter	Ordovician	1700-1710	10	sandstone
Knox Lower	Ordovician			
Upper	Cambrian	1710-4236	2526	dolomite
Eau Claire	Cambrian	4236-4500	264	dolomite

(a)

WIC KY-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Knox Eau Claire	Trenton-Black River
(2) Depth (Ft.)	4500	1010
(3) Thickness (Ft.)	1400	700
(4) Formation Fluid Pressure, psi	1370	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Ord. Camb.	Ordovician
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	23° 32°	
(11) Character and Areal Distribution	dolomite widespread	shale widespread

C. Chemical Characteristics of Formation Fluids: TDS = 207,000 ppm; Ca = 25,000 ppm; Cl = 130,000 ppm; Na = 47,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 140,000 ppm NaCl; 25,000 ppm NaOH; 20,000 ppm sodium hypochlorite.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 1
   B. Conc. Dissolved Solids, mg/l: 146,000 - 160,000
   C. Specific Gravity: 1.106
   D. Temperature: 140° F
   E. pH: 1.0

WIC KY-3

3. **Toxicity:** HCl dissolved in water; corrosive to skin, Cl_2 vapors in equilibrium with solution irritant and congestive to mucous membranes.

4. **Reactivity with Surface Equipment Components:** Corrosive acid solution.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** No BOD as such.

7. **Pre-injection Waste Treatment:** The wastes held in storage tanks, first; pumped through a rough precoat filter and then through a polishing filter (one micron detention).

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17"	42#/ft. H-40	11-3/4"	430'
Intermediate	10-5/8"	32#/ft. H-40	8-5/8"	3128'
		Hastelloy	8-5/8"	3060-3070'
Injection		Fiberglass	4-1/2"	3060'
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 338' - Halliburton EPSEAL. Remainder - common cement.

3. **Well Head Equipment (Name and Models):** Grey Tool Company - CWC Flanged Well Head, 3000 psi working pressure.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Hastelloy Full Bore Packer, 3060-4300'; Texas Iron Works.

5. **Bottom Hole Completion:** Open hole 3100-4300'

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Storage tanks

2. **Filters:** Rough precoat filter and polishing filter

WIC KY-3

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Continuous monitored waste injection pressure and flow. (Recorded) A separate 2760' monitor well monitoring information above injection zone.

B. Sampling Frequency and Water Quality Parameters Measured: Formation water pressure continuously monitored and water sampled periodically sampled for pH

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: This well is standby well for KY-2.

3. Regulatory Aspects

A. Construction Requirements: All satisfied.

B. Monitoring Requirements: Monitor well.

C. Restrictions of Operation Procedures: 80,000,000 gallons of waste per year.

Well Id. Code: LA-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: American Cyanimid Company
P.O. Box 10008 - New Orleans, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 03 (Year) 73
2. Latitude and Longitude: 29°57'22"/90°16'10"
3. Well Location (Legal Description): Sec 3, T13S, R22E, 4000 ft. from the SE corner on a bearing of N 22°20' W
4. County: Jefferson State: Louisiana
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Acrylonitrile, methyl methacrylate, melamine, hydrogencyanide, yellow prussiate of soda.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 30 gpm
4. Injection Pressure: 40 psi
5. Total Depth of Well: 2722 ft.
6. Name, Age, and Depth of Injection Zone: Pliocene, 1790 ft.
7. Date Injection Began: (Day) 09 (Month) 03 (Year) 66
8. Total Volume Injected to Date: 23,117,382 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-1

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	2355	1000
(3) Thickness (Ft.)	140	1360
(4) Formation Fluid Pressure, psi	1097	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	1652	
(7) Age of Unit	Pliocene	Pliocene
(8) Porosity %	27	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	39°	
(11) Character and Areal Distribution	sand regional	shale regional

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	1000	extensive	sand	fresh - brackish

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Normally only coagulated water; well is a standby well for LA-2.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC LA-1

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Settling and filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	47# J-55	11-3/4	2538.55
Intermediate		32.2# H-40	9-5/8	2337.89
Injection		4.7# H-40	2-3/8	2461.53
Other		0.344 waU	20"	106.55

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 17-3/4 inch casing - 1775 sks.

3. **Well Head Equipment (Name and Models):** Gray Tool Co. 11-3/4 inch O.D. x 9-5/8 x 2-3/8 inch 8 RD well head assembly 1440 psi W.P., 2175 psi test.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer @ 2337.89 ft. Baker Model "G"-53-6.813B x 11-3/4 inch.

5. **Bottom Hole Completion:** Perforations in 11-3/4 inch casing from 2465 ft. to 2495 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 150 ft. of 6" steel pipe.

2. **Filters:** 1-9' diameter downflow sand filter.

WIC LA-1

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	1/73	Average	43	Maximum	
"	1/72		30		100
"	1/70		30		100
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	1/73	Average	30	Maximum	100
"	1/72		40		60
"	1/70		40		60
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow volume and pressure.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements:

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: American Cyanamid Company
P.O. Box 10008 - New Orleans, Louisiana

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** ______ **(Month)** 03 **(Year)** 73
2. **Latitude and Longitude:** 29°57'22"N/90°16'10"W
3. **Well Location (Legal Description):** 3708 ft. from SE corner of Sec. 3, T13S, R22E on bearing N 23°-29'W.
4. **County:** Jefferson Parish **State:** Louisiana
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Acrylonitrile, methyl methacrylate, melamine, hydrogen cyanide, yellow prussiate of soda.
2. **Date Well Permitted:** 1/66 **Completed:** ______
3. **Injection Rate:** 300 gpm
4. **Injection Pressure:** 105 psi
5. **Total Depth of Well:** 3295
6. **Name, Age, and Depth of Injection Zone:** Pliocene, 2355
7. **Date Injection Began: (Day)** ______ **(Month)** 05 **(Year)** 66
8. **Total Volume Injected to Date:** 23,117,382 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** ______ **(Year)** ______
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Undifferentiated	Recent	0		shale and sand
	Pleistocene		1000	
Undifferentiated	Pleistocene	1000		shale
	Pliocene		1360	sands
	Pliocene	2365	125	sand
	Pliocene	2745	65	unconsolidated sand
	Pliocene	2980	200	unconsolicated sand

(a)

WIC LA-2

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1790	1000
(3) Thickness (Ft.)	1480	1360
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	2086	
(7) Age of Unit	Pliocene	Pliocene
(8) Porosity %	34	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	39°	
(11) Character and Areal Distribution	unconsolidated sand	shale and sand

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Undifferentiated	0	1000	extensive	sands	fresh to brackish

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Ammonia, sulfates, urea, cyanide, sulfuric acid.

2. Physical/Chemical Description

A. Conc. Suspended Solids, mg/l: N/A
B. Conc. Dissolved Solids, mg/l: N/A
C. Specific Gravity: N/A
D. Temperature: N/A
E. pH: N/A

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Settling and filtration.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	47# J-55	11-3/4	3266.43
Intermediate		32.3# J-55	9-5/8	2876.64
Injection		0.300 wall fibercast	3-1/2	3008
Other		0.375 wall	20	95.78

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 11-3/4 inch casing - 1900 sks common w/gel.

3. **Well Head Equipment (Name and Models):** Gray Tool Company 11-3/4" OD x 9-5/8" OD x 3-1/2" OD; 2175 psi test, 1440 psi W.P.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer 8 Baker Model "6"-53-68138 9-5/8" x 11-3/4"; centralizers: spaced every 100' on 3-1/2" fibercast tubing.

5. **Bottom Hole Completion:** Perforations in 11-3/4 inch casing from 3085-3200 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Tanks: 13,500 gal. plastic, 10,000 gal. plastic, 10,000 gal. steel; piping: 1500 ft. 3" polypropylene line steel pipe; 1200 ft. of 6" steel pipe.

2. **Filters:** Four-9' diameter steel downflow sand filters, one-4' dia. rubber lined steel upflow filter, two-4' dia. plastic upflow; two-18 inch rubber lined polishing

WIC LA-2

3. **Pumps:** Eight - steel pumps; four - alloy 20 pumps.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	1966-1968	Average	250	Maximum	300
"	7/71, 8/71, 9/71		300		
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	1966-1968	Average	110	Maximum	160
"	7/71, 8/71, 9/71		105		115
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow volume and pressure.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

(d)

Well Id. Code: LA-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND
Operating Company Name and Address: American Cyanamid Co.
P.O. Box 10008, New Orleans, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 09 (Year) 71
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: St. Charles State: Louisiana
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Acrylonitrile, methyl methacrylate, melamine, hydrogen cyanide, yellow prussiate of soda
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 4815 ft.
6. Name, Age, and Depth of Injection Zone: 4200 - 5350 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC LA-3

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	1000		sand	fresh

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: All wells within 3 mile radius are plugged or to be of proper order.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Acrylonitrile, methyl methacrylate, melamine, hydrogen cyanide, yellow prussiate of soda.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A.

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			20	100
Intermediate		48# H-40	13-3/8	1200
		36# K-55	9-5/8	4196
Injection		Fibercast	7-5/8	4815
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Epoxy resin 293-323 ft. outside of 9-5/8" casing; liner hanger @ 4109'

5. Bottom Hole Completion: Perforations 3100-3220 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC LA-3

3. Pumps: ______

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

   A. Monitoring Devices and Data: ______

   B. Sampling Frequency and Water Quality Parameters Measured: ______

   C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects

   A. Construction Requirements: ______

   B. Monitoring Requirements: ______

   C. Restrictions of Operation Procedures: ______

Well Id. Code: LA-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Blackburn Gas Plant
Cotton Valley Operations, Blackburn, La.

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 03 (Year) 73
2. Latitude and Longitude: 32°46'30" / 93°21'30"
3. Well Location (Legal Description): 300' south and 350' east of the NW corner of the NW 1/4, SE 1/4 SE quarter, Sec. 26, T21N, R9W
4. County: Webster State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Gasoline plant wastes and cooling tower overflow
2. Date Well Permitted: 1964 Completed:
3. Injection Rate: 10gpm
4. Injection Pressure: 625 psi
5. Total Depth of Well: 1049
6. Name, Age, and Depth of Injection Zone: 1049
7. Date Injection Began: (Day) 28 (Month) 12 (Year) 64
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-4

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection:
N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate		26#	6-5/8	1155
Injection		47#	2-3/8	1025
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 6-5/8 inch casing - 200 sx 8% JEL - 50 sx common

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Perforated 1049 - 1069 ft. and 1078 - 1088 ft. with 4 shots per foot

6. Hydraulic Fracturing, Acidizing Programs, etc.: 5000 gal. HCl acid

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Pump suction vat is of concrete 20'x20'x5' deep float controlled pump switch

2. Filters: N/A

WIC LA-4

3. Pumps: Gas Triplex

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	12-28-64	Average	15	Maximum	
"	10-01-70		15		
"	4-01-71		10		
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	12-28-64	Average	450	Maximum	
"	10-01-71		1100		
"	4-01-71		625		
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: flow and pressure

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: Borden Chemical Co.
Geismar, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°13'10"/91°00'00"
3. Well Location (Legal Description): N/A
4. County: Ascension State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Dissolved inorganics and organics.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 3500 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-5

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l:
   - B. Conc. Dissolved Solids, mg/l:
   - C. Specific Gravity:
   - D. Temperature:
   - E. pH:

WIC LA-5

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC LA-5

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-6

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: APP Operational Status: PND
Operating Company Name and Address: Borden Chemical Co.
Geismar, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°13'10"/91°00'00"
3. Well Location (Legal Description): N/A
4. County: Ascension State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Dissolved inorganics and organics.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 3500 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-6

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
- A. Conc. Suspended Solids, mg/l:
- B. Conc. Dissolved Solids, mg/l:
- C. Specific Gravity:
- D. Temperature:
- E. pH:

3. Toxicity: ____________________

4. Reactivity with Surface Equipment Components: ____________________

5. Degradability Level and Rate: ____________________

6. Biological Level at Injection and Estimated Biological Level After Injection: ____________________

7. Pre-injection Waste Treatment: ____________________

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: ____________________

3. Well Head Equipment (Name and Models): ____________________

4. Packers, Centralizers, and Other Subsurface Equipment: ____________________

5. Bottom Hole Completion: ____________________

6. Hydraulic Fracturing, Acidizing Programs, etc.: ____________________

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: ____________________

2. Filters: ____________________

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3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-7

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: APP Operational Status: PND

Operating Company Name and Address: Borden Chemical Co.
Geismar, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°13'10"/91°00'00"
3. Well Location (Legal Description): N/A
4. County: Ascension State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Dissolved organics and inorganics.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 3500 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l:
   - B. Conc. Dissolved Solids, mg/l:
   - C. Specific Gravity:
   - D. Temperature:
   - E. pH:

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3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC ______ LA-7 ______

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-8

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: Chevron Chemical Co., Oak Point Plant
Belle Chase, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 29°48'50"/90°01'00"
3. Well Location (Legal Description): N/A
4. County: Plaquemines State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sulfides, phenol, hydrocarbons, choloides.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 2700 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

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3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-9, LA-10

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Cities Service Oil Company
P.O. Box 1562 - Lake Charles, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°10'30"/93°19'40"
3. Well Location (Legal Description): Sec 19, T10S, R9W
4. County: Calcasieu State: Louisiana
5. SIC Classification: 2999

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sour water containing sulfides, cyanides, ammonia, chlorides, iron and traces of copper, nickel and chromium.
2. Date Well Permitted: Completed: 1/15/71
3. Injection Rate: 210,000,000 gpy
4. Injection Pressure: 350 - 500 psig
5. Total Depth of Well: 5,000 ft.
6. Name, Age, and Depth of Injection Zone: Miocene, 4775 ft.
7. Date Injection Began: (Day) 26 (Month) 08 (Year) 71
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: Effluent to Calcasieu River

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	4775	
(3) Thickness (Ft.)	200	
(4) Formation Fluid Pressure, psi	2300	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Miocene	
(8) Porosity %	30	
(9) Permeability, millidarcies	6000	
(10) Reservoir Temperature, °C	49°	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Brine - 7.3 pH; 48,000 ppm Cl⁻; 3,100 ppm Ca; 1,600 ppm Mg.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Brine

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: None

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Ammonia = 2100 ppm; sulfides = 2100 ppm; chlorides = 177 ppm; cyanides = 6 ppm; BOD = 4000 ppm; phenol = 198 ppm; traces of iron, copper, nickel, and chromium
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.0
   D. Temperature: 95 - 110° F
   E. pH: 8.5

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20"	65# H-40	16	1101
Intermediate	14-3/4"	40.5, 45-5, 51.0#, K-55	10-3/4	4773
		(3,000', 1,000', 900')		
Injection		26.4# K-55	7-5/8	4710
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:**
865 Sacks, Class A Modified - Surface
2,185 Secks, Class A Modified - Intermediate

3. **Well Head Equipment (Name and Models):** Cameron A-20501

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer - 7-5/8 x 10-3/4" Strings - approximately 90' intervals

5. **Bottom Hole Completion:** 18" diameter, Underreamed Hole 6-5/8" OD UOP - Johnson Screen and 396 cubic feet of gravel

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 500 gals 1% Surfactant, 1,000 Gal, HF plus inhibitor

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 3,000 barrel hemispheroid 26' x 32' high carbon steel, epoxy lined, Flow lines all carbon steel

2. **Filters:** 4-400 gpm expoxy lined sand filters, x 5' T-T, Carbon steel

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3. **Pumps:** Centrifugal injection pumps - 800 gpm at 500 psig.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	12/13/71	**Average**	307	**Maximum**	
"	2/13/72		384		
"	7/22/72		360		
"	12/13/72		400		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	12/13/71	**Average**	368	**Maximum**	
"	2/13/72		380		
"	7/22/72		420		
"	12/13/72		440		

3. **Annual Volume Injected, gal.**
A. 1972 211,846,400 B. 1971 74,647,600 C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Well is constructed with safety annulus equipped with pressure monitoring device.

B. **Sampling Frequency and Water Quality Parameters Measured:** Water is not sampled.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Not done

2. **Contingency Plan for Well Failure During Operation:** Installation of another well or a sour water stripper unit.

3. **Regulatory Aspects**

A. **Construction Requirements:** Permit received based on casing, program, geologic data and protection of fresh water sands - plant effluent composition also provided to state.

B. **Monitoring Requirements:** Annulus monitored by observing pressure gauge, injection rates are metered and injection pressures recorded.

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: LA-11

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Cotton Valley Operators Committee, Cotton Valley Field, Webster Parrish, La.

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 03 **(Year)** 73
2. **Latitude and Longitude:** 32°46'50"/93°21'30"
3. **Well Location (Legal Description):** Sec. 26, T21N, R9W
4. **County:** Webster **State:** Louisiana
5. **SIC Classification:** 2911

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Blowdown water.
2. **Date Well Permitted:** 1939 **Completed:** 5-21-71
3. **Injection Rate:** 157,500 gpd
4. **Injection Pressure:** 350 psig
5. **Total Depth of Well:** 2600 plugged back from 5749
6. **Name, Age, and Depth of Injection Zone:** 2600
7. **Date Injection Began: (Day)** 21 **(Month)** 05 **(Year)** 71
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy

A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Cook Mountain	Oligocene			
Sparta	Oligocene			
Cane River	Eocene			
Wilcox	Eocene			sand, shale
Arkadelphia	Cretaceous			shale
Nacatosh	Cretaceous	1700	200	sand
Saratoga	Cretaceous			limestone
Marlbrook	Cretaceous			shale
Annona	Cretaceous			limestone
Ozan	Cretaceous			shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Buckrange/Nacatosh	
(2) Depth (Ft.)	2538 / 1700	
(3) Thickness (Ft.)	20 / 200	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	200	
(7) Age of Unit	Eocene	
(8) Porosity %	25	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Sparta	80	200		sand & gravel	20-300 ppm Cl

4. Mineral Resources in Area: Oil and gas, gravel and iron ore are produced in this area

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Gasoline plant-recycling project

2. Physical/Chemical Description

A. Conc. Suspended Solids, mg/l: 50
B. Conc. Dissolved Solids, mg/l: 1552
C. Specific Gravity: N/A
D. Temperature: 42° C
E. pH: 9.5

(b)

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Biocide and filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12 1/2	47.6#	9 5/8	6/5
Intermediate	8 3/4	18.#	5	5732
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): Cameron Iron Works tree

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: 80 holes

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Three concrete oil-water separation pits, one earth pit, one concrete suction pit. Four inch steel line to second stage pump and three inch steel line to injection well.
2. **Filters:** one-Crall 12-9-27 P discharge filter

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3. **Pumps:** Two electric driven Ingersoll-sand pumps, one Gaso pump for second stage

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	9-6-71	**Average**	150	**Maximum**	160
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	9-6-71	**Average**	300	**Maximum**	400
"					
"					
"					

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

   A. **Monitoring Devices and Data:** N/A

   B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

   C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

   A. **Construction Requirements:** N/A

   B. **Monitoring Requirements:** N/A

   C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: LA-12

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Dow Chemical Company
Plaquemines, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 04 (Year) 73
2. Latitude and Longitude: 30°19'20"/91°14'00"
3. Well Location (Legal Description): Sec 8, T9S, R12E
4. County: Iberville State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant wastes - sodium chloride solution.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 4200 ft.
6. Name, Age, and Depth of Injection Zone: Miocene, 3900 ft.
7. Date Injection Began: (Day) 15 (Month) 05 (Year) 69
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	3900	
(3) Thickness (Ft.)	300	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Miocene	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Undifferentiated	0	1000	regional	sand, gravel	fresh - brackish

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sodium chloride brine

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. **Pumps:** ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-13

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP
Operating Company Name and Address: E.I. DuPont de Nemours and Co.,
Pontchartrain Works, La Place, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) (Month) 03 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Fee Ld. S.W.D. No. 1, Sec. 90, T-11S, R7E
4. County: St. John the Baptist State: Louisiana
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sodium chloride brine with miscellaneous ingredients from the production of nylon intermediate neoprene
2. Date Well Permitted: 7/27/62 Completed:
3. Injection Rate: 118,000 gpd
4. Injection Pressure: 260 psi
5. Total Depth of Well: 5232
6. Name, Age, and Depth of Injection Zone: Miocene, 1880
7. Date Injection Began: (Day) 28 (Month) 9 (Year) 64
8. Total Volume Injected to Date: 24,903,000 (Gallons)
9. Date Injection Ceased: (Day) 10 (Month) 07 (Year) 72
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Miocene & Younger	0	5232	sand, shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	4560	800
(3) Thickness (Ft.)	75	
(4) Formation Fluid Pressure, psi	2338 at 5232 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	3365 at 5232 ft.	
(7) Age of Unit	Miocene	
(8) Porosity %	27	
(9) Permeability, millidarcies	2500 at 5232 ft.	
(10) Reservoir Temperature, °C	42° at 5232 ft.	
(11) Character and Areal Distribution	sand-infinite	shale and sand

C. Chemical Characteristics of Formation Fluids: 3.4% Chloride Ion, 1990 ppm Hardness as CaCO, 1440 ppm sulfate ion, 3.5% TDS, 8.49 pH taken at 5022 ft.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Shallow sand	0	800		sand	

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: All wells within a 3 mile radius are plugged or operating properly

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 5-20% NaCl, 0-500 ppm cyan

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Material blending, pH and chemical treatment and solid separation and removal.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	H-40	16	114
Intermediate	15	23# Protective	10-3/4	1014
Injection	9-7/8	26#	7	5202
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16 inch casing - common cement w/13% $CaCl_2$; 10-3/4 inch casing - 665 sks Portard cement w/2% gel. + 2% $CaCl_2$; 7 inch casing - 810 sks Pozmix w/3% gel + 1180 sks Pozmix w/13% gel.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Differential valve tool at 3034 ft.; spring steel centralizers run every 90 ft. on 7 inch casing.

5. Bottom Hole Completion: Perforated 3790 ft. to 3904 ft. with 4 - 8 shots per foot.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 6% HF and 10% HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Storage tanks and clarifier hold up time capabilities of 1.5 days; surge storage capacity of 10 inches of rainfall.

2. Filters: Primary and secondary filters provided to remove solid down to 10 microns.

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3. Pumps: Two centrifugal pumps

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	6/16/71	Average	180	Maximum	180
"	7/11/71		260		260
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow rate and pressure.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-14

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: E.I. DuPont de Nemoure and Company
LaPlace, Louisiana

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** N/A
3. **Well Location (Legal Description):** Sec 90, T11S, R7E
4. **County:** St. John the Baptist **State:** Louisiana
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injectrd:** Aqueous brine from the manufacture of nylon intermediates and neoprene
2. **Date Well Permitted:** 11/24/64 **Completed:**
3. **Injection Rate:** N/A
4. **Injection Pressure:** 200 psi
5. **Total Depth of Well:** 5300 ft.
6. **Name, Age, and Depth of Injection Zone:** Miocene, 1850 ft.
7. **Date Injection Began: (Day)** 24 **(Month)** 11 **(Year)** 64
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Miocene	0	5237	sand, shale

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1850	0
(3) Thickness (Ft.)	3800	1800
(4) Formation Fluid Pressure, psi	2312 at 5162 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	4645 at 5162 ft.	
(7) Age of Unit	Miocene	Miocene
(8) Porosity %	32.5 - 35	
(9) Permeability, millidarcies	1250 - 1500	
(10) Reservoir Temperature, °C	55° at 5162 ft.	
(11) Character and Areal Distribution	sand	shale

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sodium chloride brine with miscellaneous constueints including: copper, cyanide, ammonia

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.2
   - D. Temperature: N/A
   - E. pH: 7 - 11

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-Injection Waste Treatment:** Material blending, pH and chemical treatment and solids separation and removal

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	16	H-40 casing	16 in	68
Intermediate	15	#23 protective casing	10 3/4	1030
Injection		#26 protective casing	7	5225.7
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4" - 620 sks 7" - 900 sks

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** 1) tubing packer; 2) differential valve tool @ 3034 ft.; 3) spring steel centralizers every 90' on 7" casing

5. **Bottom Hole Completion:** casing perforated 1) from 3790 - 3850'; 2) from 4840-4880 4617'; slotted liner and gravel packed @5150-5180 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** acidize with HCl/HF, "Super HF" 2000 gal. 3790-3850 ft.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** storage tanks and clarifier

2. **Filters:** primary/secondary filters

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3. Pumps: 2 stage centrifugal pumps

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	6/1/71	Average	180,000 lb/hr	Maximum	185,00 lb/hr
"	6/14/71		100,000		150,00 "
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	6/1/71	Average	250	Maximum	270
"	6/14/71		200		380
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: The well casing was cemented from the bottom shoe to the surface using a differential valve tool. The casing was perforated at the desired injection zone.

B. Monitoring Requirements: injection pressures and volume of waste injected are recorded.

C. Restrictions of Operation Procedures: Control of injection pressures, material composition, pH, temperature, and solids content are maintained.

Well Id. Code: LA-15

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: E.I. DuPont de Nemours, Pontchartrain Works
LaPlace, Louisiana

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data:** (Day) 01 (Month) 06 (Year) 73
2. **Latitude and Longitude:** N/A
3. **Well Location (Legal Description):** Fee Ld. S.W.D.; No. 3, Sec 90, T11S, R7E
4. **County:** St. John the Baptist **State:** Louisiana
5. **SIC Classification:** 2821

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Aqueous brine from the manufacture of nylon intermediates and neoprene.
2. **Date Well Permitted:** 5/2/67 **Completed:**
3. **Injection Rate:** N/A
4. **Injection Pressure:** 260 psi
5. **Total Depth of Well:** 5243 ft.
6. **Name, Age, and Depth of Injection Zone:** Miocene, 1867 ft.
7. **Date Injection Began:** (Day) 23 (Month) 11 (Year) 67
8. **Total Volume Injected to Date:** N/A (Gallons)
9. **Date Injection Ceased:** (Day) (Month) (Year)
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Miocene	0	5243	sand, shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1867	
(3) Thickness (Ft.)	3375	
(4) Formation Fluid Pressure, psi	2343	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	4717	
(7) Age of Unit	Miocene	
(8) Porosity %	27	
(9) Permeability, millidarcies	750 - 2000	
(10) Reservoir Temperature, °C	52° at 5243 ft.	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sodium chloride brine containing ammonia and copper.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Material blending, pH adjustment and chemical treatment, solids evaporation and removal.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	16	H-40	16	100
Intermediate	15	J-55	10-3/4	1048
Injection		26# J-55	7	5226.18
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 915 sks Portland w/4% gel and 3% $CaCl_2$; 7 inch casing - 1900 cu. ft. of slurry composed of 50% Portland cement, 5% Pozmix A, and 2% gel.

3. Well Head Equipment (Name and Models): 10-3/4" x 7" Gray well head assembly

4. Packers, Centralizers, and Other Subsurface Equipment: Spring steel centralizers run on 90 ft. spacing on the 7 inch casing.

5. Bottom Hole Completion: Perforations - 3800 to 3920 ft., 4872 to 4932 ft., and 5130 to 5170 ft. 4 shots/ ft. et. shaped charges.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized - 6% HF and 10% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Storage tanks and clarifier.

2. Filters: Primary and secondary.

3. Pumps: 2 stage centrifugal

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	3/30/71	Average 60,000#/hr	Maximum 88,000#/hr
"	7/12/71	115,000#/hr	123,000#/hr
"			
"			

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	3/30/71	Average 205	Maximum 275
"	7/12/71	260	270
"			
"			

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow volume and pressure.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-16

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: E.I. DuPont de Nemours, Pontchartrain Works
P.O. Box 2000 - LaPlace, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Fee Ld, SW.D., No. 4, Sec 90, T11S, R7E
4. County: St John the Baptist State: Louisiana
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Brine and byproducts from nylon and neoprene manufacture.
2. Date Well Permitted: 10/12/69 Completed:
3. Injection Rate: N/A
4. Injection Pressure: 456 psi
5. Total Depth of Well: 4957 ft.
6. Name, Age, and Depth of Injection Zone: Miocene, 4890 ft.
7. Date Injection Began: (Day) 27 (Month) 10 (Year) 69
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Miocene	0	4900	sand, shale

(a)

WIC LA-16

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	4850	
(3) Thickness (Ft.)	27	
(4) Formation Fluid Pressure, psi	2190	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	4410	
(7) Age of Unit	Miocene	
(8) Porosity %	27	
(9) Permeability, millidarcies	750 - 2000	
(10) Reservoir Temperature, °C	47° at 4900 ft.	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sodium chloride brine containing copper, ammonia, and cyanide.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Material is blended, pH adjustment, solid removal.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	40.5# H-40	10-3/4	1014
Intermediate				
Injection	9-7/8	23# K-55	7	4890
Other		Liner	4-1/2	4832-4927

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 550 sks 50-50 Pozmix w/20 gal. 2% gel + 2% $CaCl_2$ + 100 sks common w/2% $CaCl_2$; 7 inch casing - 700 sks 50-50 Pozmix + 100 sks common + 760 sks 50 Pozmix

3. Well Head Equipment (Name and Models): Spring steel centralizers every 90 ft. on 7 inch casing.

4. Packers, Centralizers, and Other Subsurface Equipment: Packer at 4789 ft.

5. Bottom Hole Completion: 4-1/2 inch OD stainless steel screen installed using 42 jacks of 40 x 60 mesh; gravel held in place with a packer.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized - 3000 gal. of 15% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Storage tank and clarifier.

2. Filters: Primary and secondary

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3. **Pumps:** material is blended, pH adjustment solid removal

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
2-24-71	76,000 lbs/hr	90,000 lbs/hr
" 7-21-71	74,000 lbs/hr	75,000 lbs/hr
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
2-24-71	144	257
" 7-21-71	456	456
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow volume and pressure

B. Sampling Frequency and Water Quality Parameters Measured:
N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads:
N/A

2. Contingency Plan for Well Failure During Operation:
N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-17

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: E. I. Du Pont de Nemours and Co.,
Pontchartrain Works, LaPlace, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 02 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Fee LD. SWD No. 5 Sec. 90, T11S, R7E
4. County: St. John the Baptist State: Louisiana
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chlorinated hydrocarbon (diesel oil injected as a flush liquid between injections) mixture of high and low boiling hydrocarbon wastes
2. Date Well Permitted: 10/3/69 Completed:
3. Injection Rate: 3,000,000 gpy
4. Injection Pressure: 1750 psi
5. Total Depth of Well: 5163
6. Name, Age, and Depth of Injection Zone: Miocene, 4880
7. Date Injection Began: (Day) 26 (Month) 02 (Year) 70
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Miocene & Younger		0	5163	Sand, Shale

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	4880	
(3) Thickness (Ft.)	3298	
(4) Formation Fluid Pressure, psi	2270 at 5000 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	4570 at 5000 ft.	
(7) Age of Unit	Miocene	
(8) Porosity %	27	
(9) Permeability, millidarcies	1200 at 5000 ft.	
(10) Reservoir Temperature, °C	50° at 5000 ft.	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Alluvium	100	500	extensive	sand, gravel	good

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Carbon - 40 to 45%; hydrogen - 5 to 10%; chloride - 45 to 55%

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Blended and filtered

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	11	32.3# H-40	9-5/8	1006
Intermediate	8-3/4	17.0# J-55	5-1/5	5140
Injection		S.S. lining tubing	2-3/8	5067
Other		Liner	2-7/8	5105-5163

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 9-5/8 inch casing - 150 sks Class A; 5-1/2 inch casing - 786 sks Pozmix + 100 sks common.

3. **Well Head Equipment (Name and Models):** 9-5/8" x 5-1/2" x 2-3/8" Gray Tool Co. assembly.

4. **Packers, Centralizers, and Other Subsurface Equipment:** 5-1/2 inch casing - centralizers spaced every 90 ft.; differential valve tool at 2285 ft., deisel oil in annulus.

5. **Bottom Hole Completion:** Gravel packed with Hydrojet perforations in 5-1/2 inch casing.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized - 9% HCl + HF

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Holding tank with 4 day capacity.

2. **Filters:** Cartridge type - 10 microns

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3. **Pumps:** positive displacement pump having 50 gpm capacity with 12-25 psig suction pressure and 2900 psig maximum discharge pressure

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) 6-1-71 Average 17.4 M lb/hr. Maximum 17.4 M lb/hr.
"
"
"

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) 6-1-71 Average 1750 Maximum 1800
"
"
"

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: flow and pressure

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-18

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: E.I. DuPont deNemours and Co.
Pontchartrain Works, LaPlace, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 02 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Fee. Ld. SWD No. 6 Sec. 90 T-115
4. County: St. John the Baptist State: Louisiana
5. SIC Classification: 2821

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: chlorinated hydrocarbon material (diesel oil injected as a flush liquid between periods of injection) - mixture of high and low boiling hydrocarbon waste
2. Date Well Permitted: 9/1/69 Completed:
3. Injection Rate: 26 gpm
4. Injection Pressure: 1200 psi
5. Total Depth of Well: 6510
6. Name, Age, and Depth of Injection Zone: Miocene, 6325
7. Date Injection Began: (Day) 15 (Month) 12 (Year) 69
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Miocene & Younger		0		sand, shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	6325	
(3) Thickness (Ft.)	27	
(4) Formation Fluid Pressure, psi	2312 at 5162 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	5208 @ 6500 ft.	
(7) Age of Unit	Miocene	
(8) Porosity %	27	
(9) Permeability, millidarcies	2000 - 3600	
(10) Reservoir Temperature, °C	55° at 6516 ft.	
(11) Character and Areal Distribution	sand - infinite	shale

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
alluvium	100	500	variable	sand, gravel	good

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:
N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): carbon - 40 to 45% hydrogen- 5 to 10% Chloride - 45 to 55% diesel oil used as a flush

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.10 - 1.20
   D. Temperature: N/A
   E. pH: 7

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** The waste material is blended and filtered prior to injection

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-1/2	36# H-40	9 5/8	1028
Intermediate				
Injection	3-3/4	17.0# J-55	5 1/2	6496
Other		S.S. lined tubing	2 3/8	6432

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 9 5/8 inch casing - 150 sx Class A w/ 2% CaCl + 670 sx 50/50 Pozmix w/ 2% gel 2% $CaCl_2$ 5 1/2 inch casing - 770 sx 50/50 Pozmix (0- 2722 ft) + 825 sx 50/50 Pozmix + 100 sx Class Aw/ 0.2 to 1% HR, Retarder (2722 to bottom)

3. **Well Head Equipment (Name and Models):** 9 5/8" x 5 1/2" x 2 3/8" Gray Tool Co. Assembly

4. **Packers, Centralizers, and Other Subsurface Equipment:** corrosion resistant packer at 6432 ft.; Differential valve tool @ 2722 ft. 5 1/2 inch casing stainless steel lined bottom 80 ft. Annulus filled with diesel oil.

5. **Bottom Hole Completion:** gravel packed around 2 3/8 inch slutted Hostelley

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** acidized - 9% HCl + HF

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** holding tank capacity provides approximately four days storage

2. **Filters:** cartridge type are used to remove particles above 10 microns

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3. **Pumps:** A positive displacement pump having 50 gallons per minute capacity with 12 - 25 psig suction pressure and 2900 psig maximum discharge pressure.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	7-7-71	Average	26	Maximum	26
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	7-7-71	Average	1200	Maximum	1700
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: flow and pressure

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-19

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: Ciba - Geigy Corporation
P.O. Box 11 - St. Gabriel, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 03 (Year) 73
2. Latitude and Longitude: 30°14'40"/91°05'40"
3. Well Location (Legal Description): N/A
4. County: Iberville State: Louisiana
5. SIC Classification: 2879

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from the production of agricultural chemicals.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 112 gpm
4. Injection Pressure: 783 psi
5. Total Depth of Well: 6002 ft.
6. Name, Age, and Depth of Injection Zone: Pliocene-Miocene Sands, 3600 - 5675 ft.
7. Date Injection Began: (Day) 25 (Month) 10 (Year) 70
8. Total Volume Injected to Date: 36,100,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Quaternary	0	600	sand, gravel
	Pliocene	600	5200	sand, shale
	Miocene	5000	6002	sand, shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	3600/4150/4750/5550	
(3) Thickness (Ft.)	120 260 70 125	
(4) Formation Fluid Pressure, psi	2500	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	3800	
(7) Age of Unit	Pliocene-Miocene	
(8) Porosity %	30 - 35	
(9) Permeability, millidarcies	1000 - 5000	
(10) Reservoir Temperature, °C	51°	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Pleistocene	100	500		sand, gravel	good

4. Mineral Resources in Area: There are five oil and gas fields located within 10 miles of the well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste consists of 4.6% hydrochloric acid (aqueous solution). Traces of ammonium chloride, chlorine, hydrogen cyanide, and cyanogen chloride.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** The stream is cooled to 100°F, diluted to 3-6% HCl strength, filtered and injected into the well.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	32.75#/Ft. H-40	10 3/4	915
Intermediate	9 7/8	24.40#/Ft. N-80	7 5/8	5415
Injection		11 #/ft. J-55 Pentor Coated	4	5364
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10 3/4 inch casing-425sx 50-50 Litepoz w/4% gel + 300sx Class "A" 3/3% CaCl.; 7 5/8 inch casing-213sx Trini Lt. Wt. + 315sx Class "H" (1st stage) 540sx Trini Lt.Wt. (2nd stage)

3. **Well Head Equipment (Name and Models):** casting head cmt. 10 3/4" x 7 5/8", 3" 600# ASA Titanium Master Valve, 3" - 300# ASA Hast C gate valve Ladish B375

4. **Packers, Centralizers, and Other Subsurface Equipment:** Baker "Lok-set" Packer (Penton coated)

5. **Bottom Hole Completion:** performations 5580-5630ft. w/ 8 shots/ft. 2 7/8 inch O.D. Hastelloy inside screen from 5548-5630 ft. with 2 stage gravel pack.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized with 15% HCl and mud acid (10,000 gal and 5,000 gal respectively)

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 2-15,000 gal. rubber-lined horiozontal holding tanks, kynar lined steel piping.

2. **Filters:** 2 - diatomaceous earth vacuum, 2 banks of 3 each cartridge guard filters.

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3. **Pumps:** 2 - Durce Hi Silicon Iron acid pumps; 2-teflon-lined Gould pumps; 3 - sundyne injection pumps

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	10-27-70	Average	139	Maximum	225
"	6-19-71		112		136
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	10-27-70	Average	567	Maximum	700
"	6-19-71		783		800
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow and pressure

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-20

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0
Operating Company Name and Address: Georgia-Pacific Corp., P.O. Box 629
Plaquemine, Louisiana 70764

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 15 T9S, R13E
4. County: Iberville State: Louisiana
5. SIC Classification: 2499

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: phenol, dimethyl-benzl alcohol, alpha methyl styrene, acetophenone, cumene hydroperoxide
2. Date Well Permitted: Completed: August 1970
3. Injection Rate: 120 gpm
4. Injection Pressure: 300 psi
5. Total Depth of Well: 3596
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) 14 (Month) 7 (Year) 72
8. Total Volume Injected to Date: 58,000,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: TDS = 108,000 ppm; Chloride = 66,000 ppm; pH = 6.3

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Aqueous stream containing phenol, cumene hydroperoxide, acetone, sodium phenolate, sodium carbonate, and sodium hydroxide.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: 2/3-rds of the waste is treated in API separator and the remainder is pumped to waste settler tanks. The entire waste is filtered through sand filters .

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	65# H-40 LT&C	16	791
Intermediate	13-1/2	36# J-55 LT&C	9-5/8	3435
Injection		14# J-55 LT&C	5-1/2	3304
Other		46# J-55	2-3/8	300

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16" casing - 728 sks common w/3% $CaCl_2$ + 628 sks common w/8% Halliburton gel; 13-1/2" casing - 2760 cu. ft. Pozmix + NaCl.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Otis MR-9001, 9-5/8" x 5-1/2" expandable packer.

5. Bottom Hole Completion: 155' of slotted 20, 316 s.s., 6-5/8" well screen affixed to 5-1/2". Underreamed to 20" and gravel packed with Texbalst TCM 175

6. Hydraulic Fracturing, Acidizing Programs, etc.: 1400 gallons of 12% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Carbon steel waste settler tank 20' dia x 24" with 3" carbon steel lines to well.

2. Filters: 2 parallel sand filter beds

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3. **Pumps:** Two 150 gpm, 190 psi AP pumps; One 350 gpm, 216 psi AP pump.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	4/10/71	Average	197	Maximum	244
"	5/5/71		100		200
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	4/10/71	Average	200	Maximum	200
"	5/5/71		400		430
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Outer casing cemented and injection tubing maintained above well head pressure to assure no leakage of contaminants into other than injection strata.

B. Monitoring Requirements: Pressure between outer casing and injection tubing maintained above well head pressure to assure no leakage of contaminants into other than injection strata.

C. Restrictions of Operation Procedures: Oily substances removed and solids filtered. Well operation is monitored to assure safe operation. Well design intended to give trouble free operation.

Well Id. Code: LA-21

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Hercules Incorporated, Synthetics Dept. Allemania Plant, Plaquemine, Louisiana

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 15 **(Month)** 06 **(Year)** 1970
2. **Latitude and Longitude:** N/A
3. **Well Location (Legal Description):** Sec. 13, T9S, R13E, 1,600 Ft. from South line and 300 ft. from East line
4. **County:** Iberville **State:** Louisiana
5. **SIC Classification:** 2818

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Sodium Chloride, Sodium Bicarbonate, Hydrochloric Acid and various Sulfur and Phosphorous Compounds and trace amounts of Aromatic Solvent
2. **Date Well Permitted:** Dec. 18, 1970 **Completed:**
3. **Injection Rate:** 756 gpd
4. **Injection Pressure:** 70 to 152 psi
5. **Total Depth of Well:** 4,450 ft. (Original) Plugged Back- Total Depth 4,404 ft.
6. **Name, Age, and Depth of Injection Zone:** Sand, 4135-4417
7. **Date Injection Began: (Day)** 18 **(Month)** 12 **(Year)** 1970
8. **Total Volume Injected to Date:** 15,000,000 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	4135	500
(3) Thickness (Ft.)	269	3700
(4) Formation Fluid Pressure, psi	0.43 psi/ft est	
(5) Lithostatic Pressure, psi	1.0 psi/ft est	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est	
(7) Age of Unit	Miocene	Pliocene & Miocene
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand, widespread	clays, sands widespread

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Potable water well on plant property, 472 feet from the injection well, drawing water from the 420 feet level. This well was completed in November 1967 and placed in service in March 1969.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Industrial process waste from Thiophosphate Process containing various sulfur and phosphorus compounds not identified and trace amounts of aromatic solvents.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: Total Solids - 7,400 to 15,500
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity: 1.001 to 1.014
   D. Temperature: N/A
   E. pH: 0.5 to 6.6

(b)

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Storage tank or pit, parallel pressure filters, surge tank. pH adjustment by addition of hydrochloric acid to maintain acid stream.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	94# H-40 API-ST&C	20	124
Intermediate	18	75# J-55 API-ST&C	16	790
	15	51# J-55 API-ST&C	10-3/4	4293
Injection	10-3/4	Fibercast Tubing	7-5/8	4404
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 16" casing - 270 sks Lite weight + 200 sks class A + 75 sks class A common; 10-3/4" casing - 1073 sks Halliburton lite weight + 520 sks Latex; 7-5/8" casing - 350 sks class H w/12% gel, 1% CF-2 + 100 sks resin.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** 16" guide shoe @ 790 ft.; seating nipple @ 2069 ft., Otis Binch No-Go; Halliburton float collar @ 4250 ft.; guide shoe @ 4293 ft.

5. **Bottom Hole Completion:** Perforated 4257 - 4268 ft. w/22-1/2" jet perforations and sanfixed.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Two 242,000 gallon holding tanks, carbon steel with interior lining of 3" Fibercast and Alloy 20 piping.

2. **Filters:** Two sand filters and two cartridge polishing filters.

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3. **Pumps:** Transfer pump - 200 gpm at 70 psi; injection pump - 200 gpm at 200 psi The two pumps are in series

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	1/1/71	**Average**	32	**Maximum**	32
"	3/11/71		63		84
"	5/24/71		35		48
"	2/18/72		64		80
"	8/29/72		53		80

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	N/A	**Average**		**Maximum**	
"					
"					
"					

3. **Annual Volume Injected, gal.**
A. 1972 656,880 B. 1971 18,736,200 C. 1970 541,800

VIII. SAFETY INFORMATION

1. **Monitoring Program**

   A. **Monitoring Devices and Data:** Pressure recording device, flow recording and control, pH recording

   B. **Sampling Frequency and Water Quality Parameters Measured:** Sampling once per shift; composite analysis once per day; pH, total solids and organic compounds

   C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** Holding tanks and diked area.

3. **Regulatory Aspects**

   A. **Construction Requirements:** Permit required from Louisiana Department of Conservation

   B. **Monitoring Requirements:** Semi-annually; daily average waste, total waste, cumulative total waste and chemical composition of waste

   C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: LA-22

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: APP Operational Status: PND

Operating Company Name and Address: Intercoastal Drilling
S. Houma, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 29°33'15"/90°41'50"
3. Well Location (Legal Description): Sec. 12, T17S, R17E
4. County: Terrebonne State: Louisiana
5. SIC Classification: 1312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Crude waste - sediments
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone:
2200 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

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3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) __________ Average __________ Maximum __________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) __________ Average __________ Maximum __________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

3. Annual Volume Injected, gal.
A. 19__ __________ B. 19__ __________ C. 19__ __________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: LA-23

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PNC Operational Status: PC
Operating Company Name and Address: Kellys Truck Terminal
Greenwood Rd., Caddo Parish, louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 32°37'00"/93°56'40"
3. Well Location (Legal Description): Sec 19, T17N, R15W
4. County: Caddo State: Louisiana
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 1100 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program
    - A. Monitoring Devices and Data: ____________________
    - B. Sampling Frequency and Water Quality Parameters Measured: ____________________
    - C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________
2. Contingency Plan for Well Failure During Operation: ____________________
3. Regulatory Aspects
    - A. Construction Requirements: ____________________
    - B. Monitoring Requirements: ____________________
    - C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-24

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND

Operating Company Name and Address: Monochem
Geismar, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Ascension State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 2000 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

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3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-25

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND
Operating Company Name and Address: Monochem
Geismar, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Ascension State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone:
2000 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-25

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

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3. Toxicity: ______

4. Reactivity with Surface Equipment Components: ______

5. Degradability Level and Rate: ______

6. Biological Level at Injection and Estimated Biological Level After Injection: ______

7. Pre-Injection Waste Treatment: ______

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: ______

3. Well Head Equipment (Name and Models): ______

4. Packers, Centralizers, and Other Subsurface Equipment: ______

5. Bottom Hole Completion: ______

6. Hydraulic Fracturing, Acidizing Programs, etc.: ______

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: ______

2. Filters: ______

(c)

WIC ______ LA-25 ______

3. Pumps: ____

____

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____

____

B. Sampling Frequency and Water Quality Parameters Measured: ______

____

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects

A. Construction Requirements: ____

____

B. Monitoring Requirements: ____

____

C. Restrictions of Operation Procedures: ______

____

____

Well Id. Code: LA-26

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: NOP

Operating Company Name and Address: Mason-Rust-NASA, Michoud Assembly Facility
New Orleans, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 11 (Year) 72
2. Latitude and Longitude: 30°01'/89°54'
3. Well Location (Legal Description): Part of Sec. 37, T12S, R13E
4. County: Orleans State: Louisiana
5. SIC Classification: 1925

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: The industrial waste is generated from metal surface treatment areas, tube and valve cleaning rooms, paint shops, machine and areas, welding shops, laboratories, X-ray rooms, hydrostatic test areas.
2. Date Well Permitted: 1963 Completed:
3. Injection Rate: 412,000 gpd
4. Injection Pressure: 500 psi
5. Total Depth of Well: 6665
6. Name, Age, and Depth of Injection Zone: Miocene, 6428
7. Date Injection Began: (Day) (Month) 02 (Year) 64
8. Total Volume Injected to Date: 300,000,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

WIC LA-26

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	6428	
(3) Thickness (Ft.)	200	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Miocene	
(8) Porosity %	27	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	shale

C. Chemical Characteristics of Formation Fluids: Salt water

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	0	100		sand	high TDS

4. Mineral Resources in Area: Oil is produced in large amounts from numerous salt domes in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): No oil or cyanide disposed by the well.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	H-40 42#	11-3/4	1200
Intermediate	10-5/8	5-5 26#	7-5/8	6600
Injection		Inside coated w/baked epoxy	5-1/2	6600
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 11-3/4 inch casing - Trinity Lite Wate 3118 sks.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer 5-1/2" Lynes special clearance external casing; centralizer casing; 1-above float shoe, 1-above float collar, 1-per length of pipe up to 5,000 ft. depth.

5. **Bottom Hole Completion:** Hole was under reamed and gravel packed with 0.030" 0.040" gravel. Perforated - 5849 to 5874 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidizing with Fe acid and mud acid.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Concrete holding pond 366' x 146' coated with an acid resistant epoxy cement.

2. **Filters:** Two each, epoxy sand 1/2" thick, size of sand 0.030" - 0.040"

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3. Pumps: Oil well triplex plunger.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-27

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Mason-Rust-NASA, Michoud Assembly Facility
730 Gravier New Orleans, Louisiana 70130

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** N/A **(Month)** **(Year)**
2. **Latitude and Longitude:** 30°01'/89°54'
3. **Well Location (Legal Description):** Sec. 37, T12S, R13E
4. **County:** Orleans **State:** Louisiana
5. **SIC Classification:** 1925

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Chemicals used in metal treating processes.
2. **Date Well Permitted:** N/A **Completed:**
3. **Injection Rate:** 400,000 gpd
4. **Injection Pressure:** 500 psi
5. **Total Depth of Well:** 6618
6. **Name, Age, and Depth of Injection Zone:** N/A
7. **Date Injection Began: (Day)** **(Month)** 08 **(Year)** 68
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

(a)

WIC ________________ LA-27

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: ________________

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: ________________

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: ________________

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): ________________

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: ________________
   B. Conc. Dissolved Solids, mg/l: ________________
   C. Specific Gravity: ________________
   D. Temperature: ________________
   E. pH: ________________

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		0.375" wall	16	100
Intermediate		42# H-40	11-3/4	1200
		26.4# J&N	7-5/8	6430
Injection		17# J-55	5-1/2	6360
Other		Fiberglass tubing	2-3/8	6550

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 5-1/2 x 7-5/8" Packer @ 6340 ft.

5. Bottom Hole Completion: Perforated - 6390 to 6391 ft., slotted lined 6430 to 550 with gravel packing.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC LA-27

3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

   A. Monitoring Devices and Data:

   B. Sampling Frequency and Water Quality Parameters Measured:

   C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

   A. Construction Requirements:

   B. Monitoring Requirements:

   C. Restrictions of Operation Procedures:

Well Id. Code: LA-28A

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND

Operating Company Name and Address: PPG Industries
Lockport, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°13'10"/93°17'40"
3. Well Location (Legal Description): Sec. 4, T10S, R9W
4. County: Calcasieu State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: NaCl, Na_2SO_4, Na_2CO_3, Hg, Ca, Mg
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone:
4850 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC LA-28A

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

3. Pumps: ______

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______

B. Sampling Frequency and Water Quality Parameters Measured: ______

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects

A. Construction Requirements: ______

B. Monitoring Requirements: ______

C. Restrictions of Operation Procedures: ______

(d)

Well Id. Code: LA-28B

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PND Operational Status: PND

Operating Company Name and Address: PPG Industries
Lockport, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°13'10"/93°17'40"
3. Well Location (Legal Description): N/A
4. County: Calcasieu State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: $NaCl$, Na_2SO_4, Na_2CO_3, Hg, Ca, Mg
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone:
4850 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-28B

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-29

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Rubicon Chemicals Inc. - Geismar Plant, Geismar, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec. 11, T10S, R2E, Ascension Parish, Louisiana
4. County: Ascension State: Louisiana
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste process streams from nitrobenzene, aniline, diphenylamine, toluene diamene, toluene di-isocyanate, dinitrotoluene and diphenylmethane, di-isocyanate processes.
2. Date Well Permitted: Completed: 12/14/70
3. Injection Rate: 70 million gpy
4. Injection Pressure: 30 to 250 psi
5. Total Depth of Well: 3950 ft.
6. Name, Age, and Depth of Injection Zone: Miocene, 3600 ft.
7. Date Injection Began: (Day) 17 (Month) 01 (Year) 71
8. Total Volume Injected to Date: 106,000,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: Discharged to the Mississippi River

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	3600	
(3) Thickness (Ft.)	240	
(4) Formation Fluid Pressure, psi	1700	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Miocene	
(8) Porosity %	30	
(9) Permeability, millidarcies	5000	
(10) Reservoir Temperature, °C	38°	
(11) Character and Areal Distribution	Blanket Sand 25 miles x 35 miles	

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: Brine

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Uniroyal, Geismar, La., Borden, Geismar, La.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Inorganic salts are primarily sulfates, chlorides and nitrates. Organic phase is notrobenzene, dinitrotoluene, toluene diamine, aniline, introcresols, chlorinated hydrocarbons.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 20 mg/L of less than 10 micron
   B. Conc. Dissolved Solids, mg/l: 25,000
   C. Specific Gravity: 1.0
   D. Temperature: 70° to 95°F
   E. pH: 5-7

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Waste streams collected in a 825,000 gal. storage tank. 85% suspended solids is removed by settling. The overflow is pumped thru sand filters to remove solids larger than 10 micron size prior to injection. pH control

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	48.0# H-40	13-3/8	802
Intermediate	12-1/4	36.0# K-55	9-5/8	3605
Injection		23.0# K-55	7	3553
Other		0.500 inch wall conductor casing	20	93

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - 635 sks. Type A; 9-5/8 inch casing - 1150 sks Type A.

3. Well Head Equipment (Name and Models): Cameron 2000# WP

4. Packers, Centralizers, and Other Subsurface Equipment: Packer-7" x 9-5/8 inch retrievable pins w/hold up slips; centralizers on 13-3/8 OD and 9-5/8 inch asing strings at approximately 90' intervals.

5. Bottom Hole Completion: 200' - 6-5/8" OD UOP - Johnson Screen and gravel pack. 18" diameter under-reamed hole with 465 cu. ft. gravel.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized periodically as required.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 1-825,000 ga. C.S. Buffer Storage Tank; 1.5 x 106 gal. emergency reservoir.

2. Filters: 2 - Hayward Md. S-400 Downflow Sand Filters w/automatic controls; disposable element guard filter

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3. **Pumps:** 2 - Durco Mod. 3 x 1-1/2 - 13/106 centrifugal injection pumps, 1-Durco Med. 3 x 3 5-10/86 Reservoir Drais pump.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	5/14/71	Average	52	Maximum	60
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	5/14/71	Average	80	Maximum	80
"	1972		120		185
"					
"					

3. Annual Volume Injected, gal.
A. 1972 67,000,000 B. 1972 28,000,000 C. 1970

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Casing head pressure

B. Sampling Frequency and Water Quality Parameters Measured: Twice per week for solids, pH, specific gravity and temperature.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Effluent storage tank capable of holding two weeks' storage of effluent.

3. Regulatory Aspects

A. Construction Requirements: Tested 13-3/8 inch casing at 500 psi and 9-5/8 casing at 1000 psi. Tested packer.

B. Monitoring Requirements: Annulus monitored by observing pressure gauge.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-30

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Shell Chemical Co. - Geismar,
P.O. Box 500 - Geismar, Louisiana 70734

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) N/A (Month) ______ (Year) ______
2. Latitude and Longitude: 30°12'/91°00"
3. Well Location (Legal Description): Begin NW/C, Lot 1, Sec. 14, T10S, R2E, th. N 55°35'59" E along prop. line 3452.6 th. N 55°03" E 735.05' th.
4. County: Ascension State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste with 32% Hydrochloric Acid.
2. Date Well Permitted: 1967 Completed: ______
3. Injection Rate: 15,057 gpd
4. Injection Pressure: 0-30 psi
5. Total Depth of Well: 4100
6. Name, Age, and Depth of Injection Zone: Pliocene, 2396
7. Date Injection Began: (Day) ______ (Month) ______ (Year) 67
8. Total Volume Injected to Date: 33,700,000 (1/15/73) (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) ______ (Year) ______
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Quaternary	0	1980	sand, clay, shale
	Tertiary	1980	2120	sand, clay, shale

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	unnamed	entire sequence
(2) Depth (Ft.)	1980	
(3) Thickness (Ft.)	2120	3500
(4) Formation Fluid Pressure, psi	1760	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	2650	
(7) Age of Unit	Pliocene	Quanternary & Tertiary
(8) Porosity %	27	
(9) Permeability, millidarcies	2000	
(10) Reservoir Temperature, °C	43°	
(11) Character and Areal Distribution	sand	shale & sand

C. Chemical Characteristics of Formation Fluids: 25,000 - 50,000 ppm Cl

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chlorination of paraffins waste products - 32% w/aqueous HCl.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Three stages of phase separation.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15	32.75# H-40	10-3/4	740
Intermediate	9-7/8	24# H-40	7	2973
Injection	6-1/4	Fiberglass tubing	5-1/2	4063
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 500 sks Class A; 7-5/8 inch casing - 590 sks Class A; 4-1/2 inch tubing - 415 sks Lite weight.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Float collar @ 4066 w/5' cement; float shoe @ 4100 ft.

5. Bottom Hole Completion: Perforations 2396-2400.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Squeezed zone w/EPOSAND 112.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Two 16,000 gal. Owens-Corning Fiberglass tanks with 3" fiberglass piping to well head.

2. Filters: N/A

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3. Pumps: Centrifugal pump - solid teflon; 100 gpm, 30 psi.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
1-68 to 7-70	17	44
7-70 to 7-71	12	44
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Approval of well design by the LA. Geological Survey and LA. State Board of Health.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-31

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Shell Chemical Co.
Geismar, Louisiana 70734

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) N/A (Month) (Year)
2. Latitude and Longitude: 30°12'/91°00"
3. Well Location (Legal Description): Begin NW Cor. Lot 1, Sec. 14, T10S, R2E, th. N 55°35'59" E along prop. line. 3452.6' th. N 55°56'03" 735.05 th.
4. County: Ascension State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Plant-wide wastewater.
2. Date Well Permitted: 1967 Completed:
3. Injection Rate: 14017 gpd
4. Injection Pressure: 200 psi
5. Total Depth of Well: 1700
6. Name, Age, and Depth of Injection Zone: 1285
7. Date Injection Began: (Day) (Month) (Year) 67
8. Total Volume Injected to Date: 2,532,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Quaternary	0	1700	sand, clay, shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1285	
(3) Thickness (Ft.)	143	
(4) Formation Fluid Pressure, psi	800	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	1105	
(7) Age of Unit	Quaternary	
(8) Porosity %	33	
(9) Permeability, millidarcies	3000	
(10) Reservoir Temperature, °C	32°	
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Plant-wide wastewater collection system - 2% w/dissolved organic compounds.

2. Physical/Chemical Description
   A. Cons. Suspended Solids, mg/l: N/A
   B. Cons. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Screened thru 100 micron strainer. When solids are present, a precoat filter is used to remove solids.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	9-7/8	23# J-55	7	1012
Intermediate	6-1/4	17# N-80	5-1/2	1698
Injection	6-1/4	24# J-55	1-1/4	1496
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 7 inch casing - 500 sks Class A; 5-1/2 inch casing - 100 sks common.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Float collar @ 1654', Set Shoe @ 1698 ft.; packer, 5-1/2" x 3-1/2" BOT @ 1509 ft.

5. Bottom Hole Completion: 3-1/2" screen 1509-1579 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Tank - 135,000 gallon steel; lines - 4" carbon steel to well.

2. Filters: N/A

3. **Pumps:** Centrifugal pump, 200 gpm, 200 psi.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	1-68 to 7-71	**Average**	10	**Maximum**	152
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	1-68 to 7-71	**Average**	200	**Maximum**	200
"					
"					
"					

3. **Annual Volume Injected, gal.**
A. 19__ N/A B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. **Monitoring Program**

   A. **Monitoring Devices and Data:** N/A

   B. **Sampling Frequency and Water Quality Parameters Measured:** N/A

   C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** N/A

3. **Regulatory Aspects**

   A. **Construction Requirements:** N/A

   B. **Monitoring Requirements:** N/A

   C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: LA-32

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0
Operating Company Name and Address: Shell Chemical Co.
Geismar, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) N/A (Month) (Year)
2. Latitude and Longitude: 30°12'/91°00"
3. Well Location (Legal Description): Begin NW/C Lot 1 Sec. 14, T10S, R2E th. N55°35'59" along prop. line 3452.6' th.
4. County: Ascension State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Plant-wide wastewater.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 14,017 gpd
4. Injection Pressure: 200 psi
5. Total Depth of Well: 4100 PBTD 3943
6. Name, Age, and Depth of Injection Zone: Pliocene, 31,000, 3800
7. Date Injection Began: (Day) (Month) 06 (Year) 71
8. Total Volume Injected to Date: 7,400,000 (1/15/73) (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Quarternary	0	1700	sand, clay, shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit		Confining Bed
(1) Name			
(2) Depth (Ft.)	3100	3800	
(3) Thickness (Ft.)	300	250	
(4) Formation Fluid Pressure, psi			
(5) Lithostatic Pressure, psi			
(6) Hydrofracturing Pressure, psi			
(7) Age of Unit	Pliocene		
(8) Porosity %			
(9) Permeability, millidarcies			
(10) Reservoir Temperature, °C			
(11) Character and Areal Distribution			

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Plant-wide wastewater collection system - 2% dissolved organics.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	62.5#	32.7#	10-3/4	784
Intermediate	15	24#	7-5/8	3009
Injection	9-7/8		16	107
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 400 sks Class A. 7 inch casing - 350 sks. Common, 7-5/8 inch casing - 590 sks.

3. **Well Head Equipment (Name and Models):** Float collar @ 2475 ft; Halliburton shoe guide @ 2506 ft.

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Perforation - 3100 to 3400 ft. and 3800 - 4050 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 2 - 16,000 gal. Owens-Corning Fiberglass tanks with 3" fiberglass piping to well head.

2. **Filters:** N/A

3. Pumps: Centrifugal pump - solid teflon; 100 gpm, 30 psi.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average 13	Maximum 60
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average 0-30	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-33

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Shell Chemical Company
Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) ______ (Month) 03 (Year) 73
2. Latitude and Longitude: 30°30'/90°25'00"
3. Well Location (Legal Description): From the NW corner Sec. 3, T12S, R8E; thence S 83°48'E a distance of 1342.5 ft.; thence N 16°51' E a distance of 649'
4. County: St. Charles State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: 20° Baume aqueous hydrochloric acid
2. Date Well Permitted: N/A Completed: ______
3. Injection Rate: 13 gpm
4. Injection Pressure: 0-20 psi
5. Total Depth of Well: 1740
6. Name, Age, and Depth of Injection Zone: Pliocene, 1230
7. Date Injection Began: (Day) ______ (Month) 08 (Year) 68
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) ______ (Year) ______
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1230	
(3) Thickness (Ft.)	680	
(4) Formation Fluid Pressure, psi	810 psi @ 1790 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	
(8) Porosity %	30-32	
(9) Permeability, millidarcies	1000-3000	
(10) Reservoir Temperature, °C	36°	
(11) Character and Areal Distribution	med. grained sand	

C. **Chemical Characteristics of Formation Fluids:** Salt water: 3500 ppm chlorides, Sp. Gr. 1.05, pH 7.2, Cl - 3.87% wt., Ca-0.27% wt., Mg - 0.10% wt., Na & K - 2.01% wt., TDS - 7.3% wt., Silica 29 ppm, Fe-1 ppm.

3. **Geohydrology of Fresh Water and Other Useful Aquifers**

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. **Mineral Resources in Area:** N/A

5. **Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:** N/A

IV. WASTE CHARACTERISTICS

1. **Technical Description (Including Radioactivity):** 20° Baume aqueous hydrochloric acid.

2. **Physical/Chemical Description**
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Stream is a pure sales grade product.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	22	62.6#/ft.	16	100
Intermediate	16	42#/ft.	11-3/4	1000
	12	17 #/ft.	7	1286
Injection	12	4.5 #/ft.	6	1286 to 1730
Other	5	2.5 #/ft.	3-1/2	1740

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 11-3/4 casing 570 sks.; 7" casing 760 sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 7" OD cemented to 11-3/4 casing. Hastelloy 'B' Johnson well screen at 1750 ft.

5. Bottom Hole Completion: Perforations 1740-1750'

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Plant HCl storage capacity is 64,000 gal. waste HCl is pumped through 2" plastic line to 650 gallon plastic surge tank and flows by gravity down well from surge tank.

2. Filters: N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Approval by Louisiana Geological Survey and Health Department.

B. Monitoring Requirements: NA

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-34

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: Shell Chemical Company
Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** 30°30'/90°25'10"
3. **Well Location (Legal Description):** From NW Corner Sec. 3, T12S, R8E, thence S 10° 55' W a distance 5920.2 ft.; thence S 83°48'40" E a distance of 778.5'.
4. **County:** St. Charles **State:** Louisiana
5. **SIC Classification:** 2911

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Wastes from the manufacture of Acrolein, Acetone, and synthetic Glycerine.
2. **Date Well Permitted:** N/A **Completed:**
3. **Injection Rate:** 200 gpm
4. **Injection Pressure:** 120 psi
5. **Total Depth of Well:** 1960
6. **Name, Age, and Depth of Injection Zone:** Pliocene, 1230
7. **Date Injection Began: (Day)** **(Month)** **(Year)** 56
8. **Total Volume Injected to Date:** 3,500,000,000 **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   - **A. Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1230	
(3) Thickness (Ft.)	680	
(4) Formation Fluid Pressure, psi	810 psi at 1790 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	
(8) Porosity %	30-32	
(9) Permeability, millidarcies	1000-3000	
(10) Reservoir Temperature, °C	36°	
(11) Character and Areal Distribution	med. grained sand	

C. Chemical Characteristics of Formation Fluids: Salt water: 35,000 ppm chlorides, Sp. Gr. 1.05, pH-7.2, Cl-3.87% wt., Ca-0.27% wt., Mg.-0.10%, Na & K-2.01% wt., TDS - 7.3% wt., Silica - 29ppm, Fe - 1 ppm, Al - 5 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 99% water, 1% soluble organics, compounds present: Acrolein, Allyl Alcohol, Acetone, Methanol, Acetaldehyde, Methyl Ethyl Ketone, Glycerine, and related soluble esters.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: 120°F
   E. pH: 7.0

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Filtration to remove solids larger than 10-20 microns in diameter.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		42.8 #/ft.	16	120
Intermediate		40.5 #/ft.	10-3/4	1960
Injection		24 #/ft.	7-5/8	1897
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 16 inch casing and 10-3/4 inch casing concentrated to surface.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Perforations in 10-3/4 inch casing above plug in 10-3/4 inch casing.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Two 95,000 gal. carbon steel holding tanks; backwash basin to settle out solids for return to injection site.

2. **Filters:** Three rotary vacuum 10' dia. x 16' - 500 sq. ft., each associated with filtrate, pre-coat, and slurry handling facilities; 20 micron cuno cartridge filter polisher.

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3. **Pumps:** The injection pumps - each 700 gpm, 200 psi DP, cast iron with 125 Hp drivers.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average	200	Maximum	500
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	120	Maximum	175
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Third standby well maintained by injecting a low flow of clarified Mississippi River water.

3. Regulatory Aspects

A. Construction Requirements: Approval by Louisiana Geological Survey and Health Department.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-35

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Shell Chemical Company
Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** 30°30'/90°25'10"
3. **Well Location (Legal Description):** From the NW corner Sec. 3, T2S, R8E; thence S 10°55'W a distance of 5920.5 ft.; thence S 83°48'40" a distance 778.5'.
4. **County:** St. Charles **State:** Louisiana
5. **SIC Classification:** 2911

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Waste from manufacture of acrolein, acetone, and synthetic glycerine
2. **Date Well Permitted:** N/A **Completed:**
3. **Injection Rate:** 200 gpm
4. **Injection Pressure:** 120 psi
5. **Total Depth of Well:** 1836
6. **Name, Age, and Depth of Injection Zone:** Pliocene, 1230
7. **Date Injection Began: (Day)** **(Month)** 09 **(Year)** 59
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1230	
(3) Thickness (Ft.)	680	
(4) Formation Fluid Pressure, psi	810 at 1790 ft	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	
(8) Porosity %	30-32	
(9) Permeability, millidarcies	1000-3000	
(10) Reservoir Temperature, °C	36	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Salt water: 35,000 ppm chlorides, Sp. Gr. 1.05, pH - 7.2

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 99% water, 1% soluble organics including: Acrolein, Allyl Alcohol, Acetone, Methanol, Acetaldehyde, Methyl Ethyl Ketone, Glycerine
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Filtration to remove solids larger than 10-20 microns.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	42.8 #/ft.	16	120
Intermediate	15	40.5 #/ft.	10-3/4	1600
	15	55 #/ft.	10-3/4	1600-1900
Injection	10-3/4	26.4 #/ft.	7-5/8	1830
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: - 95,000 gallon carbon steel holding tanks; backwash basin to settle out solids for return to injection site.

2. Filters: Three rotary vacuum 10' dia. x 16' - 500 sq. ft., each associated with filtrate, pre-coat, and slurry handling facilities.

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3. **Pumps:** 700 gpm, 200 psi DP, cast iron with 125 Hp drivers.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Standby well.

3. Regulatory Aspects

A. Construction Requirements: Approval by Louisiana Geological Survey and Health Department.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: L-36

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Shell Chemical Company
Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°31'/90°25'10"
3. Well Location (Legal Description): From the NW corner Sec. 3, T12S, R8E, thence S10°55'W a distance of 5920.2 ft.; thence S83°48'40" E a distance of 778.5 ft.
4. County: St. Charles State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste from manufacture of acrolein, acetone, and synthetic glycerine.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 200 gpm
4. Injection Pressure: 120 psi
5. Total Depth of Well: 1960
6. Name, Age, and Depth of Injection Zone: Pliocene, 1230
7. Date Injection Began: (Day) (Month) 10 (Year) 64
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1230	
(3) Thickness (Ft.)	680	
(4) Formation Fluid Pressure, psi	810 at 1790 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	
(8) Porosity %	30-32	
(9) Permeability, millidarcies	1000-3000	
(10) Reservoir Temperature, °C	36	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Salt water: 35,000 ppm chlorides, Sp. Gr. - 1.05, pH - 7.2

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 99% water and 1% organics including: Acrolein, Allyl Alcohol, Acetone, Methanol, Acetoldehyde, Methyl Ethyl Ketone, Glycerine.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Filtration to remove solids larger than 10-20 microns.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		65 #/ft.	16	92
Intermediate		40.5 #/ft.	10-3/4	1020
Injection		26.4 #/ft.	7 5/8	1528
Other		23.0 #/ft.	7	1528 to 1942

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16 inch and 10-3/4 inch casing - cemented to surface; 7 inch casing; cemented to 807 ft.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______ Average ______ Maximum ______
" ______ ______ ______
" ______ ______ ______
" ______ ______ ______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______ Average ______ Maximum ______
" ______ ______ ______
" ______ ______ ______
" ______ ______ ______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-37

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Shell Chemical Company
Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** 30°30'/90°25'10"
3. **Well Location (Legal Description):** From the NW corner Sec. 3, T12S, R8E, thence S 10°55'W a distance of 5920.2 ft.
4. **County:** St. Charles **State:** Louisiana
5. **SIC Classification:** 2911

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** 20° Baume aqueous hydrochloric acid.
2. **Date Well Permitted:** N/A **Completed:**
3. **Injection Rate:** N/A
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 1740
6. **Name, Age, and Depth of Injection Zone:** Pliocene, 1230
7. **Date Injection Began: (Day)** **(Month)** 08 **(Year)** 68
8. **Total Volume Injected to Date:** 13,700,000,000 (12/31/72) **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1230	
(3) Thickness (Ft.)	680	
(4) Formation Fluid Pressure, psi	810 at 1790 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	
(8) Porosity %	30-32	
(9) Permeability, millidarcies	1000-3000	
(10) Reservoir Temperature, °C	36	
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Salt water: 35,000 ppm chloride, sp. gr. - 1.05, pH - 7.2.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-Injection Waste Treatment:** Stream is a pure sales grade product.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	22	62.6 #/ft.	16	100
Intermediate	16	42 #/ft.	11-3/4	1000
	12	17 #/ft.	7	1286
Injection	12	4.5 #/ft.	6	1286 to 1730
Other	5	2.5 #/ft.	3-1/2	1740

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Plant HCl storage capacity is 64,000 gal. Waste HCl is pumped through 2" plastic line to 650 gallon plastic surge tank and flows by gravity down well from surge tank.

2. **Filters:** N/A

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-38

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP

Operating Company Name and Address: Shell Oil Company
Norco Refinery - Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°00'/90°24'
3. Well Location (Legal Description): Sec. 6, T12S, R8E
4. County: St. Charles State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sour water (stripping steam and desalter water) high phenols concentration.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 228 gpm
4. Injection Pressure: 185 psi
5. Total Depth of Well: 1910
6. Name, Age, and Depth of Injection Zone: Pliocene, 1170 & 1300
7. Date Injection Began: (Day) 10 (Month) 09 (Year) 59
8. Total Volume Injected to Date: 880,000,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) 07 (Year) 71
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Recent	0	60	backswamp clays
	Pleistocene	60	940	sand, gravel, clay
	Pliocene	1000	1500	shale, sand, clay
	Miocene	2500	7500	sand, shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1170 & 1300	
(3) Thickness (Ft.)	630	
(4) Formation Fluid Pressure, psi	810 psi @ 1800 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	
(8) Porosity %	30-32	
(9) Permeability, millidarcies	1000-3000	
(10) Reservoir Temperature, °C	35°	
(11) Character and Areal Distribution	med. grained sand	

C. Chemical Characteristics of Formation Fluids: Brackish - below 2000 ft. salinity is approximately 35,000 ppm.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	700	110		slightly brackish	600-2600 ppm Cl
	350	90		slightly brackish	175-1700 ppm Cl
	210	160		slightly brackish	up to 650 ppm Cl

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 1750 ppm sulfides, 85 ppm phenols, 300 ppm oil content.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: 120
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 8.6

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Settling and oil skimming.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		40.5 #/ft.	10-3/4	40
Intermediate			8-1/2	
Injection	9-7/8	26 #/ft. 8RT N-80	7-5/8	1714
Other		8 RT Monel	7-5/8	1714-1794

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 35 sks common; 8-1/2 inch casing - 115 sks common w/2% gel. 7-5/8 inch casing - 325 sks common w/8% gel.

3. Well Head Equipment (Name and Models): 6"-400# tubing hanger (Cameron iron works type "GD".

4. Packers, Centralizers, and Other Subsurface Equipment: Centralizers @60 ft. intervals on bottom 500 ft. of 7-5/8" casing and @90 ft. intervals on remainder of string.

5. Bottom Hole Completion: Perforated from 1370 to 1390 ft. w/2-1/2" dia. holes per foot.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: "Sour" water drained from accumulator and reflux drums, collected in surge drum, pumped to collector header which is the suction line for the injection pump which distributes water to all wells.

2. Filters: N/A

3. **Pumps:** Two pumps capable of pumping 1200 gpm at 135 psi differential pressure. Pumps can operate individually, in parallel, or in series.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
9/11/59	209	
4/11/69	288	
9/15/69	228	

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
9/11/59	28	
4/1/69	186	
9/15/69	185	

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure and volume.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Approval by Louisiana Geological Survey and Health Department.

B. Monitoring Requirements: Average daily volume (bbls.); six month period total volume injected, cumulative total volume injected, chemical composition of waste.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-39

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Shell Oil Company
Norco Refining - Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°00'/90°24'
3. Well Location (Legal Description): Sec. 5, T12S, R8E
4. County: St. Charles State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sour water (stripping steam and desalter water) high phenol concentration.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 125 gpm
4. Injection Pressure: 130 psi
5. Total Depth of Well: 1954
6. Name, Age, and Depth of Injection Zone: Pliocene, 1440
7. Date Injection Began: (Day) 04 (Month) 01 (Year) 65
8. Total Volume Injected to Date: 520,000 (12/31/71) (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Recent	0	60	backswamp clay
	Pleistocene	60	940	sand, gravel, clay
	Pliocene	1000	1500	shale, sand, clay
	Miocene	1500	7500	sand, clay

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1440	
(3) Thickness (Ft.)	460	
(4) Formation Fluid Pressure, psi	810 psi @ 1800 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	
(8) Porosity %	30-32	
(9) Permeability, millidarcies	1000-3000	
(10) Reservoir Temperature, °C	36°	
(11) Character and Areal Distribution	med. grained sand	

C. Chemical Characteristics of Formation Fluids: Brackish below 2000 ft. salinity is approximately 35,000 ppm.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 1750 ppm sulfides, 85 ppm phenols, 300 ppm oil content.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

(b)

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Settling and oil skimming.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		55 #/ft. drive pipe	14	100
Intermediate	12-1/4	32.3 #/ft. H-30	9-5/8	1000
	9-5/8	17 #/ft. H-40		2000
Injection	7	18 #/ft. J-55	3	2000
Other		4.7 #/ft. J-55	2-3/8	1705

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 9-5/8 inch casing - 270 sks w/8% gel. 7 inch casing - 270 sks w/8% gel. 3 inch casing cemented to surface.

3. Well Head Equipment (Name and Models): 7" flange and tubing hanger API 960 R-45.

4. Packers, Centralizers, and Other Subsurface Equipment: Packer 5" OD x 7" OD type TS-8 RD THD; Centralizer - Halliburton 5-3 on bottom 3 joints of 9-5/8" casing.

5. Bottom Hole Completion: 80 link - 1 at perforations; 1/2" dia.; 1765 to 1805 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidizing - 15% Fe acid; SUR FLO S-30.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: "Sour" water drained from accumulator and reflux drums, collected in surge drums, pumped to collection header.

2. Filters: N/A

3. **Pumps:** Two pumps capable of 1200 gpm at 135 psi. Pumps can operate individually, in parallel, or in series.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) 3/20/71 Average 118 Maximum 120
" 8/3/71 125 144
"
"

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) 3/20/71 Average 172 Maximum 180
" 8/3/71 130 170
"
"

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure and flow volume

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Approval of State Geological Survey and Health Department.

B. Monitoring Requirements: Volume injected, chemical composition.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-40

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Shell Oil Company
Norco Refinery - Norco-Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°00'/90°24'
3. Well Location (Legal Description): Sec. 6, T12S, R8E
4. County: St. Charles State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sour water (stripping steam and desalter water) high phenol concentration.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 92 gpm
4. Injection Pressure: 42 psi
5. Total Depth of Well: 1997
6. Name, Age, and Depth of Injection Zone: Pliocene, 1180
7. Date Injection Began: (Day) 13 (Month) 10 (Year) 65
8. Total Volume Injected to Date: 250,000,000 (12/31/71) (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Recent	0	60	clay
	Pleistocene	60	940	sand, gravel, clay
	Pliocene	1000	1500	shale, sand, clay
	Miocene	2500	7500	sand, shale

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1180	
(3) Thickness (Ft.)	800	
(4) Formation Fluid Pressure, psi	880 psi at 1950 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	
(8) Porosity %	30-32	
(9) Permeability, millidarcies	1000-3000	
(10) Reservoir Temperature, °C	35°	
(11) Character and Areal Distribution	med. grained sand	

C. Chemical Characteristics of Formation Fluids: Brackish.

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 1750 ppm sulfides, 85 ppm phenols, 300 ppm oil.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Settling and oil skimming.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		55 #/ft. drive pipe	14	100
Intermediate	12-1/4	32.3 #/ft. H-40	9-5/8	1000
Injection	8-3/4	17 #/ft. H-40	7	2000
Other		4.2 #/ft. J-55	2-3/8	1648

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 14 inch casing - 50-50 cement and Poz. mix A 660 sks; 7 inch OD casing - 660 sks cement.

3. **Well Head Equipment (Name and Models):** 7" flange and tubing hanger.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Centralizers - Haliburton 5-3 on bottom 3 joints.

5. **Bottom Hole Completion:** Perforated with 4-1/2" dia. shots per foot at 1915 to 1955 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** SUR FLO S-30

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Sour water drained from accumulator and reflux drums, collected in surge drums, pumped to collection header then to wells.

2. **Filters:** N/A

3. Pumps: Two pumps capable of 1200 gpm at 135 psi.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	3/20/71	Average	126	Maximum	132
"	8/3/71		92		189
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	3/20/71	Average	152	Maximum	155
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure and volume of flow

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Approval of State Geological Survey and Health Department.

B. Monitoring Requirements: Daily volume and chemical composition.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-41

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: Shell Oil Company
Norco Refinery - Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** 30°00'/90°24'
3. **Well Location (Legal Description):** Sec. 6, T12S, R8E
4. **County:** St. Charles **State:** Louisiana
5. **SIC Classification:** 2911

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Sour water (stripping steam and desalter water) high phenol concentration.
2. **Date Well Permitted:** N/A **Completed:**
3. **Injection Rate:** 184 gpm
4. **Injection Pressure:** 245 psi
5. **Total Depth of Well:** 2029
6. **Name, Age, and Depth of Injection Zone:** Pliocene, 1330
7. **Date Injection Began: (Day)** 04 **(Month)** 08 **(Year)** 67
8. **Total Volume Injected to Date:** 220,000,000 (12/31/71) **(Gallons)**
9. **Date Injection Ceased: (Day)** N/A **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Recent	0	60	clay
	Pleistocene	60	940	sand, gravel, clay
	Pliocene	1000	1500	shale, sand, clay
	Miocene	2500	7500	sand, shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1330	
(3) Thickness (Ft.)	660	
(4) Formation Fluid Pressure, psi	88 psi at 1950 ft.	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	
(8) Porosity %	30-32	
(9) Permeability, millidarcies	1000-3000	
(10) Reservoir Temperature, °C	36°	
(11) Character and Areal Distribution	med. grained sand	

C. Chemical Characteristics of Formation Fluids: Brackish

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 1750 ppm sulfides, 85 ppm phenols, 300 ppm oil.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature:
   - E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Settling and filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		55 #/ft. drive pipe	14	100
Intermediate	12-1/4	32.33 #/ft. H-40	9-5/8	1000
Injection	8-3/4	17 #/ft. H-40	7	2000
Other		4-1/2 #/ft. J-55	2-3/8	1500+

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): 7" flange and tubing hanger

4. Packers, Centralizers, and Other Subsurface Equipment: Centralizers - Halliburton 5-3 on bottom 3 joints.

5. Bottom Hole Completion: Perforated 4-1/2" dia. shots per foot at 1940 to 1930 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Sour Water drained from accumulator to reflux drums, collected in surge drums, pumped to collection header then to wells.

2. Filters: N/A

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3. **Pumps:** Two pumps capable of 1200 gpm at 135 psi.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	3/20/71	Average	175	Maximum	180
"	8/3/71		184		255
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	3/20/71	Average	100	Maximum	105
"	8/31/71		245		300
"					
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure and flow volume

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Approval of Geological Survey and Health Department.

B. Monitoring Requirements: Daily volume and chemical composition

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-42

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Shell Oil Company, Norco Refinery
Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°00'00"/90°24'00"
3. Well Location (Legal Description): Sec 6, T12S, R8E
4. County: St. Charles State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sour water (stripper steam and desalter water)
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 227 gpm
4. Injection Pressure: 205 psi
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Pliocene-Miocene, 2165 ft.
7. Date Injection Began: (Day) 01 (Month) 10 (Year) 20
8. Total Volume Injected to Date: 225,000,000 (12/31/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Recent	0	60	clay
	Pleistocene	60	940	sand, gravel, clay
	Pliocene	1000	1500	shale, sand, clay
	Miocene	2500	7500	sand, shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1220 2690	
(3) Thickness (Ft.)	1470 265	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene Miocene	
(8) Porosity %	31 31	
(9) Permeability, millidarcies	2000 2000	
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand sand	

C. Chemical Characteristics of Formation Fluids: Brackish

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sulfides = 1750 ppm; phenols = 85 ppm; oil = 300 ppm

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

3. **Toxicity:** Phenols highly toxic

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Filtered and oil skimmed.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		55# drive pipe	20	100
Intermediate	17-1/2	54# J-55	13-3/8	1000
Injection	12-1/4	36# J-55	9-5/8	3500
Other		23# J-55	7	2040

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 13-3/8" casing - 50-50 Pozmix; 9-5/8" casing - 50-50 Pozmix

3. **Well Head Equipment (Name and Models):** Gray Tool Co. 13-3/8" x 9-5/8" x 7"

4. **Packers, Centralizers, and Other Subsurface Equipment:** Retrievable casing packer (Baker Model "G") on end at 7" casing for 9-5/8" casing; Centralizers - Halliburton 5-3 (3 on 13-3/8 and 3 on 9-5/8)

5. **Bottom Hole Completion:** Perforated with 4-1/2" dia. shots per foot at 2165 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidized - 15% HCl with matrazine

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Drained from accumulator to reflux drums, collected in surge drums, pumped to collection header then to well.

2. **Filters:**

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3. **Pumps:** Two pumps capable of 1200 gpm at 135 psi.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	10/15/70	Average		Maximum	240
"	3/20/71		220		238
"	8/3/71		227		279
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	10/15/70	Average		Maximum	60
"	3/20/71		190		190
"	8/3/71		205		225
"					

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure and flow volume.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Approval by State Geological Survey and State Health Department.

B. Monitoring Requirements: Volume and chemical composition

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-43

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND
Operating Company Name and Address: Sperry Rand, Army Ammo Plant
Minden, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 32°33'/93°25'
3. Well Location (Legal Description): Sec 16, T18N, R10W
4. County: Webster State: Louisiana
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Non-toxic waste water
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 1600 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

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3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-44

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: Sperry Rand, Army Ammo Plant
Minden, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 32°33'/93°25'
3. Well Location (Legal Description): Sec 16, T18N, R10W
4. County: Webster State: Louisiana
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Non-toxic waste water
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 1600 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-45

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0
Operating Company Name and Address: Sun Oil Company, Delhi Gas Plant
P.O. Box 67 - Delhi Field, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 01 (Year) 73
2. Latitude and Longitude: 32°27'50"/91°32'20"
3. Well Location (Legal Description): Sec 15, T17N, R9E
4. County: Richland State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Cooling tower blowdown water and backwash water from gas plant.
2. Date Well Permitted: 6/6/65 Completed:
3. Injection Rate: 16 gpm
4. Injection Pressure: 22" Hg vacuum
5. Total Depth of Well: 3246 ft.
6. Name, Age, and Depth of Injection Zone: Sparta Sand, Tertiary 1275 ft.
7. Date Injection Began: (Day) 06 (Month) 06 (Year) 65
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Sparta	Tertiary	756	650	sand
Wilcox	Tertiary	1765	885	sand
Clayton	Tertiary	3150	16	marl
Monroe Gas Rock	Tertiary	3166	4	limestone
Nicholson Gas Sand	Cretaceous	3170	15	sand

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Sparta	
(2) Depth (Ft.)	756	
(3) Thickness (Ft.)	660	
(4) Formation Fluid Pressure, psi	400	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	400	
(7) Age of Unit	Tertiary	
(8) Porosity %	30	
(9) Permeability, millidarcies	500	
(10) Reservoir Temperature, °C	32°	
(11) Character and Areal Distribution	sand widespread	

C. Chemical Characteristics of Formation Fluids: TDS = 16,350 ppm; chloride = 9380 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Cockfield		500		sand	fresh to brackish

4. Mineral Resources in Area: Gas

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): 35,000 ppm chloride

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 6.8

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Backwash water is pumped through filter before entering well. Blowdown water goes through sidestream filter before entering well.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-1/4	32# H-40	9-5/8	519
Intermediate	7-7/8	14# H-40	5-1/2	3245
Injection		4.7# EUE J-55	2-3/8	1159
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 9-5/8" casing - 300 sks common w/4% gel.; 5-1/2" casing - 200 sks common w/4% gel.

3. Well Head Equipment (Name and Models): National Type "B" series 900 Christmas Tree.

4. Packers, Centralizers, and Other Subsurface Equipment: Gas lift Mandrel @997 ft.; seating nipple @1155 ft.; Guiberson "shorty" packer @ 1156 ft.

5. Bottom Hole Completion: Cased hole, perforated 1120-1175 ft w/1 BSF

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 4 inch flow lines; pit used for backwash water.

2. Filters: PECO Insert filters

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3. **Pumps:** Centrifugal pump used to pump backwash water from pit.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	12/21/68	Average 18	Maximum 18
"	7/23/69	19	36
"			
"			

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average	Maximum
"			
"			
"			

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Department of Conservation well history and work resume report, State of Louisiana work permit, SWD well application approval.

B. Monitoring Requirements: Well monitored for monthly injection totals.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-46

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Tenneco Oil Company, Chalmette Refinery
Chalmette, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 01 (Year) 73
2. Latitude and Longitude: 29°56'30"/89°58'50"
3. Well Location (Legal Description): Sec 7 T13S, R12E, Louisiana Geodetic Survey
4. County: St. Bernard State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Three waste streams fro petroleum refining process units.
2. Date Well Permitted: 3/16/60 Completed:
3. Injection Rate: 180 gpm
4. Injection Pressure: 50 psi
5. Total Depth of Well: 2016 ft.
6. Name, Age, and Depth of Injection Zone: Pliocene-Pleistocene, 1850 ft.
7. Date Injection Began: (Day) (Month) (Year) 60
8. Total Volume Injected to Date: 7,366,840 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1850	
(3) Thickness (Ft.)	120	
(4) Formation Fluid Pressure, psi	930	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene-Pleistocene	
(8) Porosity %	30	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Phenols, hydrocarbons, and sulfides.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** Phenols highly toxic

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** None

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	40.5# H-40	10-3/4	87
Intermediate	9-7/8	20# J-55	7	2016
Injection		4.7# J-55 8rd EUE	2-3/8	1941
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4" casing - 50 sks Type A; 7" casing - 600 sks Type A.

3. **Well Head Equipment (Name and Models):** 600# ASA W.M. Flange w/600# flange bored for 2-3/8" OD tubing 2 - 4" Fig. 2024 Nordstrom 500# WOG Plug valves and 1 - 2" Walworth 500# WOG gate valve & X-Heavy line pipe

4. **Packers, Centralizers, and Other Subsurface Equipment:** Centralizers on 7" casing.

5. **Bottom Hole Completion:** Perforations: 6 per foot, 1957-1965 ft.; 4 jets per foot, 1940-1957 ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Once each year 8000 gal. 12% HF acid with F.E. additive

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 7500 barrel holding tank, 6" waste effluent flow line.

2. **Filters:** None

WIC LA-46

3. **Pumps:** One electric pump for pump out of holding tank.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	68	Average	180	Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	68	Average	50	Maximum	150
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Casing tested for leakage at 1000 psi.

B. Monitoring Requirements: Annual report on injected volume and injected pressure.

C. Restrictions of Operation Procedures: None

Well Id. Code: LA-47

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Tenneco Oil Company, Chalmette Refinery
Chalmette, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 01 (Year) 73
2. Latitude and Longitude: 29°56'30"/89°58'50"
3. Well Location (Legal Description): Sec 7, T13S, R12E, Louisiana Geodetic Survey
4. County: St. Bernard State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Three waste streams from petroleum refining process units - phenols, hydrocarbons, and sulfides
2. Date Well Permitted: 2/28/63 Completed:
3. Injection Rate: 180 gpm
4. Injection Pressure: 50 psi
5. Total Depth of Well: 2219 ft.
6. Name, Age, and Depth of Injection Zone: Pliocene, 1830 ft.
7. Date Injection Began: (Day) (Month) 05 (Year) 63
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-47

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1850	
(3) Thickness (Ft.)	120	
(4) Formation Fluid Pressure, psi	930	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Pliocene	
(8) Porosity %	27	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: Brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Phenols, cydrocarbons, and sulfides.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC LA-47

3. **Toxicity:** Phenol highly toxic.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** None

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		47 & 60# J-55 ST&C	11-3/4	103
Intermediate	9-7/8	32# JNS&P -8rd LT&C	7	2209
Injection		9.5# J-55 ST&C	4-1/2	1935
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 7" casing - 530 sks Class A + 12% gel + 2% $CaCl_2$

3. **Well Head Equipment (Name and Models):** 7" counterbore for weld x 4-1/2" type 6 National casing head with 8-5/8" x 10" National series 600 x 900 adapter flange.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Seal receptale at 1835'; gas lift valves and mule shoe at 1935' on 4-1/2" casing; 6 - centralizers (Weatherford-Bow); 2 on float joint - 90' intervals.

5. **Bottom Hole Completion:** Well perforated 1920'-1950' (IES) w/4 jets/ft.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Once each year - 8000 gal of 12% HCl and 3% HF acid with F.E. additive.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** One 7500 barrel holding tank; 6" flow lines.

2. **Filters:** One Warner Lewis Model No. 4 MLL - 57P1 liquid filter, 150 gpm max. capacity, 300 psig max. pressure.

WIC LA-47

3. Pumps: Electric centrifugal deep well pump for pump out of holding tank; union steam reciprocating for backwach settling pond pump out with filter.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) 68 Average 180 Maximum
"
"
"

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) 68 Average 50 Maximum
"
"
"

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Casing for leakage at 1000 psi.

B. Monitoring Requirements: Annual report on volume injected and injection pressure.

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-48

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Texaco Inc., Louisiana Refinery
P.O. Box 37 - Convent, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°06'40"/90°54'05"
3. Well Location (Legal Description): Sec 5, T11S, R3E
4. County: St. James State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sulfidic (sour) and phenolic process waste water.
2. Date Well Permitted: 9/16/65 Completed:
3. Injection Rate: 110 gpm
4. Injection Pressure: 200 psi
5. Total Depth of Well: 2200 ft.
6. Name, Age, and Depth of Injection Zone: Pleistocene, 1850 ft.
7. Date Injection Began: (Day) 01 (Month) 08 (Year) 66
8. Total Volume Injected to Date: 278,000,000 (12/31/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1850	
(3) Thickness (Ft.)	240	
(4) Formation Fluid Pressure, psi	934	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	1334 @ 2000 ft.	
(7) Age of Unit	Pleistocene	
(8) Porosity %	35	
(9) Permeability, millidarcies	1000 - 4000	
(10) Reservoir Temperature, °C	47°	
(11) Character and Areal Distribution	sand, shale extensive	

C. Chemical Characteristics of Formation Fluids: TDS = 91,000 ppm; chloride = 56,000 ppm; pH = 6.8

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
	100	500	extensive	sand	poor

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Petroleum refining wastes - sulfidic and phenolic process waste water.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. **Toxicity:** Phenol highly toxic.

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-Injection Waste Treatment:** None

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	25	Conductor casing	20	60
Intermediate	18	54.5# J-55 ST&C	13-3/8	1943
Injection	12-3/4	24# J-55 ST&C w/tube kote	8-5/8	2065
Other	24	reamed hole		2200

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 20" casing - 120 sks. common cement.

3. **Well Head Equipment (Name and Models):** Gulf Coast Machine & Supply Co., type CY casing head assembly.

4. **Packers, Centralizers, and Other Subsurface Equipment:** Packer on 8-5/8" casing @ 2065'; Halliburton contralizers, float collar, and float shoe used.

5. **Bottom Hole Completion:** Gravel packed with blank riser pipe run total depth.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 2000 gal. 15% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 2.5 million barrel tank, 8" fill and suction lines, 2" oil skim, two surge drums (7.5' x 17.5" used only when tank is being cleaned.)

2. **Filters:** 250 gpm Hayward filter with sand, Nurcon, and coal media.

WIC ____________________

3. Pumps: ____
____

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) __________ Average __________ Maximum __________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) __________ Average __________ Maximum __________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ __________ C. 19__ __________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________
____

B. Sampling Frequency and Water Quality Parameters Measured: __________
____

C. Frequency of Measuring Water Levels and Hydrostatic Heads: __________
____

2. Contingency Plan for Well Failure During Operation: __________
____

3. Regulatory Aspects

A. Construction Requirements: ______________________________
____

B. Monitoring Requirements: ______________________________
____

C. Restrictions of Operation Procedures: __________________
____
____

Well Id. Code: LA-49

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Texaco Inc., Louisiana Plant
P.O. Box 37 - Convent, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°06'40"/90°54'05"
3. Well Location (Legal Description): Sec 5, T11S, R3E
4. County: St. James State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sulfidic (sour) and phenolic process waste water.
2. Date Well Permitted: 9/16/65 Completed:
3. Injection Rate: 110 gpm
4. Injection Pressure: 200 psi
5. Total Depth of Well: 2200 ft.
6. Name, Age, and Depth of Injection Zone: Pleistocene, 1850
7. Date Injection Began: (Day) 02 (Month) 07 (Year) 66
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1850	
(3) Thickness (Ft.)	240	
(4) Formation Fluid Pressure, psi	934	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	1334 @ 2000 ft.	
(7) Age of Unit	Pleistocene	
(8) Porosity %	35	
(9) Permeability, millidarcies	1000 - 4000	
(10) Reservoir Temperature, °C	47°	
(11) Character and Areal Distribution	sand, shale	

C. Chemical Characteristics of Formation Fluids: TDS = 98,000 ppm; chloride = 57,000 ppm; pH = 6.8

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Petroleum refining wastes.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

WIC LA-49

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	25	Conductor casing	20	41
Intermediate	18	API 5L, 54.5# J-55 ST&C	13-3/8	2198
Injection		24# J-55 ST&C w/tube kote	8-5/8	
Other	24	Reamed hole		

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 20" casing - 80 sks Redimix; 13-3/8" casing - 1400 sks Pozmix and 265 sks common.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 15% HCl

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC ____________________

3. Pumps: ____
____

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	________	Average	________	Maximum	________
"	________		________		________
"	________		________		________
"	________		________		________
	________		________		________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	________	Average	________	Maximum	________
"	________		________		________
"	________		________		________
"	________		________		________
	________		________		________

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________
____

B. Sampling Frequency and Water Quality Parameters Measured: __________
____

C. Frequency of Measuring Water Levels and Hydrostatic Heads: __________
____

2. Contingency Plan for Well Failure During Operation: __________
____

3. Regulatory Aspects

A. Construction Requirements: ______________________________
____

B. Monitoring Requirements: ______________________________
____

C. Restrictions of Operation Procedures: ______________________________
____
____

Well Id. Code: LA-50

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: 0

Operating Company Name and Address: Texaco Inc., Louisiana Plant
P.O. Box 37 - Convent, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°06'40"/90°54'05"
3. Well Location (Legal Description): Sec 12, T11S, R3E
4. County: St. James State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chlorides and sulfides from petroleum refining.
2. Date Well Permitted: 4/6/70 Completed:
3. Injection Rate: 80 gpm
4. Injection Pressure: N/A
5. Total Depth of Well: 2200 ft.
6. Name, Age, and Depth of Injection Zone: Pleistocene, 1850 ft.
7. Date Injection Began: (Day) 01 (Month) 03 (Year) 70
8. Total Volume Injected to Date: 78,000,000 (12/30/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-50

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	1850	
(3) Thickness (Ft.)	240	
(4) Formation Fluid Pressure, psi	934	
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi	1334 @ 2000 ft.	
(7) Age of Unit	Pleistocene	
(8) Porosity %	35	
(9) Permeability, millidarcies	1000 - 4000	
(10) Reservoir Temperature, °C	47°	
(11) Character and Areal Distribution	sand, shale widespread	

C. Chemical Characteristics of Formation Fluids: TDS = 91,000 ppm; chloride = 56,000 ppm; pH = 6.8

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Petroleum refining wastes - sulfides, phenols and chlorides.

2. Physical/Chemical Description
A. Conc. Suspended Solids, mg/l: N/A
B. Conc. Dissolved Solids, mg/l: N/A
C. Specific Gravity: N/A
D. Temperature: N/A
E. pH: N/A

WIC LA-50

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: None

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	30	Conductor 196#	30	73
Intermediate	26	6.5#	16	1000
	14-3/4	40.5# K-55	10-3/4	1993
Injection		TK21 w/ tube kote 90	7	2105
Other		Air lift tubing	2-3/8	473

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16" casing - 2375 sks common; 10-3/4" casing - 730 sks lite wate + 435 sks common.

3. Well Head Equipment (Name and Models): Brewster well header.

4. Packers, Centralizers, and Other Subsurface Equipment: 7" packer - Texas Iron Works rubber pin packer. Baker and Dowell float shoe and collar.

5. Bottom Hole Completion: Underreamed disposal sand to 26" @ 2105'-2200' gravel packed annulus around screen (7" Monel pipe type wire wrapped).

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 54.4 million barrel ballast tank w/ 20" fill and 8" swing and suction lines; 2.5 million barrel tank with 6" fill and 4" suction line.

2. Filters: N/A

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3. Pumps: __________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: __________

B. Sampling Frequency and Water Quality Parameters Measured: __________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: __________

2. Contingency Plan for Well Failure During Operation: __________

3. Regulatory Aspects

A. Construction Requirements: __________

B. Monitoring Requirements: __________

C. Restrictions of Operation Procedures: __________

Well Id. Code: LA-51

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** NO-UP

Operating Company Name and Address: Universal Oil Products Co.
P.O. Box 1566 - Shreveport, Louisiana

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 09 **(Year)** 73
2. **Latitude and Longitude:** 32°36'40"/93°55'30"
3. **Well Location (Legal Description):** N 1/2, Sec 29, T19N, R15W
4. **County:** Caddo **State:** Louisiana
5. **SIC Classification:** 2911

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Wastes produced from the manufacture of synthetic catalyst for the petroleum refining industry - sodium, calcium, chloride, magnesium, sulfates, and organics.
2. **Date Well Permitted:** 4/28/50 **Completed:**
3. **Injection Rate:** 2,000 gpd
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 2262' plugged back to 1970'
6. **Name, Age, and Depth of Injection Zone:** Nacatoch, Cretaceous
970 ft.
7. **Date Injection Began: (Day)** 27 **(Month)** 09 **(Year)** 52
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** 12 **(Year)** 66
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wilcox	Tertiary	0	840	sand, shale
Arkadelphia	Cretaceous	840	130	shale, sand
Nacatoch	Cretaceous	970	380	sand, lime, shale
Saratoga, Markbrook	Cretaceous	1350	200	lime, shale
Annona	Cretaceous	1550	175	lime
Ozan	Cretaceous	1725	65	shale
Brownstown	Cretaceous	1790	175	shale
Tokio	Cretaceous	1965	297	shale, sand

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Nacatoch	Arkadelphia
(2) Depth (Ft.)	970	840
(3) Thickness (Ft.)	70	130
(4) Formation Fluid Pressure, psi	460	
(5) Lithostatic Pressure, psi		800
(6) Hydrofracturing Pressure, psi	800	800
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %	30	42
(9) Permeability, millidarcies	1000	
(10) Reservoir Temperature, °C	27°	27°
(11) Character and Areal Distribution	sand, lime, shale widespread	shale widespread

C. Chemical Characteristics of Formation Fluids: 10,000 ppm chloride

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Wilcox	87.5	11	lenticular	sand	potable

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Five other Universal Oil disposal wells.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Na = 1050 ppm; Cl^- = 3270 ppm; SO_4 = 801 ppm; Cr = 0.59 ppm

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: 100° F
   E. pH: 8.9

(b)

3. Toxicity: Chromate may be toxic.

4. Reactivity with Surface Equipment Components: Slightly corrosive to carbon steel.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: BOD = 1000 ppm at injection

7. Pre-injection Waste Treatment: pH control, oil skimming, septic tank treatment of sewage

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-3/4		9-5/8	200
Intermediate	8-3/4	17#	5-1/2	2260
Injection	5	Schedule 80	3	970
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 3" casing - Class A , 175 sks.

3. Well Head Equipment (Name and Models): Larkin 3" x 5-1/2" well head packer model 92. Block Valve is a Vogt 600# gate valve

4. Packers, Centralizers, and Other Subsurface Equipment: Halliburton packer shoe at 970 ft.

5. Bottom Hole Completion: Perforated 5-1/2" casing, 990'-1045'

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Underground open top concrete pits with 3" IPS flow lines.

2. Filters: Booklet strainer on injection pump section

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3. **Pumps:** Centrifugal pit transfer pumps. Triples reciprocating injection pump, 100 gpm capacity.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	N/A	**Average**		**Maximum**	
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	N/A	**Average**		**Maximum**	
"					
"					
"					

3. **Annual Volume Injected, gal.**
A. 19__ 22,000,000 B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Monitor annulus for leaks.

B. **Sampling Frequency and Water Quality Parameters Measured:** Daily sampling and monthly analysis for Na, SiO_4, Cr, Cl, SO_4, Ca, organics and pH

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Monthly

2. **Contingency Plan for Well Failure During Operation:** None

3. **Regulatory Aspects**

A. **Construction Requirements:** Special casing and cementing of the fresh water sands, casing and cementing of the well casing to the injection formation.

B. **Monitoring Requirements:** Continuous monitoring of injection waste water. Monitoring of the annulus between the tubing and the casing for tubing leaks.

C. **Restrictions of Operation Procedures:** None

Well Id. Code: LA-52

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Universal Oil Products Company
P.O. Box - Shreveport, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 32°36'40"/93°55'30"
3. Well Location (Legal Description): Sec 20, T19N, R15W
4. County: Caddo State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes produced from the manufacture of synthetic catalysts for the petroleum industry - sodium, calcium, chloride, magnesium, sulfates, and organics.
2. Date Well Permitted: 4/8/57 Completed:
3. Injection Rate: 16,500,000 gpy
4. Injection Pressure: 465 psi
5. Total Depth of Well: 2065 ft.
6. Name, Age, and Depth of Injection Zone: Nacatoch, Cretaceous 945 ft.
7. Date Injection Began: (Day) (Month) 08 (Year) 57
8. Total Volume Injected to Date: 300,000,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wilcox	Tertiary	0	810	sand, shale
Arkadelphia	Cretaceous	810	135	shale
Nacatoch	Cretaceous	945	365	sand, lime, shale
Saratoga-Marlbrook	Cretaceous	1310	210	lime, shale
Annona	Cretaceous	1520	170	limestone
Ozan	Cretaceous	1690	95	shale
Brownstown	Cretaceous	1785	175	shale
Tokio	Cretaceous	1960	105	shale, sand

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Nacatoch	Arkadelphia
(2) Depth (Ft.)	945	810
(3) Thickness (Ft.)	65	135
(4) Formation Fluid Pressure, psi	460	
(5) Lithostatic Pressure, psi		800
(6) Hydrofracturing Pressure, psi	800	800
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %	30	42
(9) Permeability, millidarcies	1000	0
(10) Reservoir Temperature, °C	27°	27°
(11) Character and Areal Distribution	sand widespread	shale widespread

C. Chemical Characteristics of Formation Fluids: Chloride = 10.000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Wilcox	87.5	11	lenticular	sand	potable

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Six Universal Oil disposal in the immediate area.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Na = 1050 ppm; Cl^- = 3270 ppm SO_4 = 801 ppm; Cr = 0.59 ppm

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 0
   B. Conc. Dissolved Solids, mg/l: 3000 - 5000
   C. Specific Gravity: 1.05
   D. Temperature: 100° F
   E. pH: 8.0

WIC LA-52

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Slightly corrosive to carbon steel.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: BOD approximately 1000 ppm at injection.

7. Pre-injection Waste Treatment: pH control, septic tank treatment of sewage.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-3/4		9-5/8	200
Intermediate	7-7/8		5-1/2	2069
Injection	5	6.5# J-55	2-1/2	970
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 9-5/8" casing - 200 sks Class A; 5-1/2" casing - 310 sks Class A; 2-1/2" casing - 75 sks Quick-Set.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Cement basket on 2-1/2 inch casing at 860 ft.

5. Bottom Hole Completion: Casing perforated - 964 to 1030 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Surface storage pond with 3" IPS flow lines.

2. Filters: None

WIC LA-52

3. **Pumps:** 100 gpm Triplex injection pump.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
"		
"		
"		

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
"		
"		
"		

3. **Annual Volume Injected, gal.**

A. 1972 19,000,000 B. 1971 14,000,000 C. 1970 26,000,000

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Monitor annulus for leaks.

B. **Sampling Frequency and Water Quality Parameters Measured:** Monthly

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Monthly

2. **Contingency Plan for Well Failure During Operation:** Cease operations. Rework of plug back well.

3. **Regulatory Aspects**

A. **Construction Requirements:** Special casing and cementing of the fresh water sands, casing and cementing to the injection formation.

B. **Monitoring Requirements:** Continuous of waste water.

C. **Restrictions of Operation Procedures:** None

Well Id. Code: LA-53

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Universal Oil Products Company
P.O. Box 1566 - Shreveport, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 32°36'40"/93°55'30"
3. Well Location (Legal Description): Sec 29, T19N, R15W
4. County: Caddo State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from the production of petroleum catalysts.
2. Date Well Permitted: 8/21/61 Completed:
3. Injection Rate: N/A
4. Injection Pressure: 600 psi
5. Total Depth of Well: 1101 ft.
6. Name, Age, and Depth of Injection Zone: Nacatoch, Cretaceous
980 ft.
7. Date Injection Began: (Day) 05 (Month) 12 (Year) 62
8. Total Volume Injected to Date: 1,500,000,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: None

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wilcox	Tertiary	0	845	sand, shale
Arkadelphia	Cretaceous	845	135	shale
Nacatoch	Cretaceous	980	120	sand, lime, shale

(a)

WIC LA-53

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Nacatoch	Arkadelphia
(2) Depth (Ft.)	980	845
(3) Thickness (Ft.)	60	135
(4) Formation Fluid Pressure, psi	460	
(5) Lithostatic Pressure, psi		800
(6) Hydrofracturing Pressure, psi	800	800
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %	30	42
(9) Permeability, millidarcies	1000	0
(10) Reservoir Temperature, °C	27°	27°
(11) Character and Areal Distribution	sand widespread	shale widespread

C. Chemical Characteristics of Formation Fluids: Chloride = 10,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Wilcox	130	10	lenticular	sand	50 ppm Cl^-

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Six other Universal Oil disposal wells in the immediate area.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cl^- = 3270 ppm; Na = 1050 ppm; SO_4 = 801 ppm; Cr = 0.59 ppm

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 0
   B. Conc. Dissolved Solids, mg/l: 3000 - 5000
   C. Specific Gravity: 1.05
   D. Temperature: 100° F
   E. pH: 8.0

WIC LA-53

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Midly corrosive to carbon steel.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: pH control

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	65#	16	300
Intermediate	15	40.5#	10-3/4	1092
	10	32#	8-5/8	962
Injection		Tubing	6-5/8	950
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16" casing - 300 sks Class A; 10-3/4" casing - 700 sks Class A; 8-5/8" casing - 675 sks Class A.

3. Well Head Equipment (Name and Models): Larkin 6-5/8" x 8-5/8" well head packer model 92. Block valve is 6" 600# gate valve.

4. Packers, Centralizers, and Other Subsurface Equipment: Halliburton packer shoe at 962 ft.

5. Bottom Hole Completion: Perforations in casing.

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Underground open top concrete pits and steel storage tanks with 8" IPS flow lines.

2. Filters: None

WIC LA-53

3. Pumps: 175 gpm injection pump.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) 12/62-8/71 Average 400 Maximum 700
"
"
"

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) 12/62-8/71 Average 600 Maximum 800
"
"
"

3. Annual Volume Injected, gal.
A. 19 71 10,000,000 B. 19 70 138,000,000 C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Monitor annulus for leaks.

B. Sampling Frequency and Water Quality Parameters Measured: Daily samples taken and composited for monthly analysis for Na, SiO_4, Cr Cl, SO_4, Ca, organics and pH.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Monthly

2. Contingency Plan for Well Failure During Operation: Cease operation.

3. Regulatory Aspects

A. Construction Requirements: Protect fresh water sands; cement to injection zone.

B. Monitoring Requirements: Continuous on waste quality.

C. Restrictions of Operation Procedures: None

Well Id. Code: LA-54

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP

Operating Company Name and Address: Universal Oil Products
P.O. Box 1566 - Shreveport, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 32°36'40"/93°55'30"
3. Well Location (Legal Description): Sec 29, T19N, R15W
4. County: Caddo State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste produced during the manufacture of synthetic catalysts for petroleum refining.
2. Date Well Permitted: 5/26/67 Completed:
3. Injection Rate: 42,900,000 gpy
4. Injection Pressure: 600 psig
5. Total Depth of Well: 1110 ft.
6. Name, Age, and Depth of Injection Zone: Nacatoch, Cretaceous 960 ft.
7. Date Injection Began: (Day) 25 (Month) 07 (Year) 67
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) 05 (Month) 10 (Year) 72
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wilcox	Tertiary	0	800	sand, shale
Arkadelphia	Cretaceous	800	160	shale
Nacatoch	Cretaceous	960	150	sand, lime, shale

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Nacatoch	Arkadelphia
(2) Depth (Ft.)	960	800
(3) Thickness (Ft.)	45	160
(4) Formation Fluid Pressure, psi	460	
(5) Lithostatic Pressure, psi		800
(6) Hydrofracturing Pressure, psi	800	800
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %	30	42
(9) Permeability, millidarcies	1000	0
(10) Reservoir Temperature, °C	27°	27°
(11) Character and Areal Distribution	sand	shale

C. Chemical Characteristics of Formation Fluids: Chloride = 10,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Wilcox	90	10	lenticular	sand	50 ppm Cl^-

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Six other injection wells.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cl^- = 3270 ppm; Na = 1050 ppm SO_4 = 801 ppm; Cr = 0.59 ppm

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 0
   B. Conc. Dissolved Solids, mg/l: 3000 - 5000
   C. Specific Gravity: 1.05
   D. Temperature: 100° F
   E. pH: 8.0

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Slightly corrosive to carbon steel.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: BOD approximately 1000 ppm.

7. Pre-injection Waste Treatment: pH adjustment, sewage treatment

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	84#	16	600
Intermediate	14-3/4	40.5#	10-3/4	1100
Injection		Tubing	8-5/8	943
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16" casing - 650 sks Class A; 10-3/4" casing - 650 sks Class A

3. Well Head Equipment (Name and Models): Larkin 8-5/8" x 10-3/4" well head packer model 92. Block valve is 8" gate valve.

4. Packers, Centralizers, and Other Subsurface Equipment: Centralizers on 16" casing at 460, 380, 300, 220, and 140 ft.; centralizers on 10-3/4" casing at 1064, 1004,945, 884, 820, 758, and 550 ft.

5. Bottom Hole Completion: Perforations at 986 to 1000 ft. and from 1006 to 1030 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Underground open top concrete pits and steel storage tank with 8 inch IPS flow lines.

2. Filters: None

3. **Pumps:** 175 gpm injection pump

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
N/A		
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
N/A		
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Monitor annulus for leaks.

B. Sampling Frequency and Water Quality Parameters Measured: Daily samples taken and composited for monthly analysis for Na, SiO_4, Cr, SO_4, Cr, organics, and pH.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: Monthly

2. Contingency Plan for Well Failure During Operation: Cease operations

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-55

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP

Operating Company Name and Address: Western Hills Service Corp.
Shreveport, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 32°28'/93°51'40"
3. Well Location (Legal Description): Sec 13, T17N, R15W
4. County: Caddo State: Louisiana
5. SIC Classification: 4959

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Treated sewage from 43 houses.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 29,750 gpd
4. Injection Pressure: N/A
5. Total Depth of Well: 1027 ft.
6. Name, Age, and Depth of Injection Zone: Nacatoch, Cretaceous
950 ft.
7. Date Injection Began: (Day) (Month) (Year) 61
8. Total Volume Injected to Date: 97,500,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) 06 (Year) 70
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wilcox	Tertiary	160	40	sand, shale
Porter's Creek	Cretaceous	200	750	shale
Nacatoch	Cretaceous	950		sand, shale

B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Nacatoch	Porter's Creek
(2)	Depth (Ft.)	950	200
(3)	Thickness (Ft.)	50	700
(4)	Formation Fluid Pressure, psi	0.45 psi/ft est	
(5)	Lithostatic Pressure, psi	1.0 psi/ft est	
(6)	Hydrofracturing Pressure, psi	1.0 psi/ft est	
(7)	Age of Unit	Cretaceous	Cretaceous
(8)	Porosity %	23	
(9)	Permeability, millidarcies		
(10)	Reservoir Temperature, °C		
(11)	Character and Areal Distribution	sand	shale

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Treated sewage

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			6-5/8	250
Intermediate			4-1/2	960
Injection		Slotted liner	2-1/2	950-1027
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 6-5/8 inch casing - ceminted to surface.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-56

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP
Operating Company Name and Address: Westwood Village Service Corp.
Shreveport, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 32°28'/93°51'
3. Well Location (Legal Description): Sec 12, T17N, R15W
4. County: Caddo State: Louisiana
5. SIC Classification: 4959

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Treated sewage from 27 houses.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 186 gpd
4. Injection Pressure: N/A
5. Total Depth of Well: 1050 ft.
6. Name, Age, and Depth of Injection Zone: Nacatoch, Cretaceous
960 ft.
7. Date Injection Began: (Day) (Month) (Year) 57
8. Total Volume Injected to Date: 92,000,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) 12 (Year) 70
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-56

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Nacatoch	Porter's Creek
(2) Depth (Ft.)	950	200
(3) Thickness (Ft.)	50	750
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %	23	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	shale

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Treated sewage

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			8	300
Intermediate			4-1/2	960
Injection		Slotted liner	2-1/2	960-1050
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: All casing cemented to surface.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: 12 inch diameter hole below 4-1/2 inch casing.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: __________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: __________

2. Contingency Plan for Well Failure During Operation: __________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-57

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: APP Operational Status: PND

Operating Company Name and Address: Wyandotte Chemical
Geismar, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°11'30"/91°00'00"
3. Well Location (Legal Description): Sec 14, T10S, R2E
4. County: Ascension State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: NaCl, organic solids
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 4000-6000 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC LA-57

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

(c)

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3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.

A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-58

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: Wyandotte Chemical
Geismar, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°11'30"/91°00'00"
3. Well Location (Legal Description): Sec 11, T10S, R2E
4. County: Ascension State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: NaCl, organic solids
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone:
9000 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

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3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. **Pumps:** ____

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ____ B. 19__ ____ C. 19__ ____

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____

B. Sampling Frequency and Water Quality Parameters Measured: ____

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____

2. Contingency Plan for Well Failure During Operation: ____

3. Regulatory Aspects

A. Construction Requirements: ____

B. Monitoring Requirements: ____

C. Restrictions of Operation Procedures: ____

Well Id. Code: LA-59

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Yarbrough STP, Dept. of Sanitation
Shreveport, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 32°34'/93°51'40"
3. Well Location (Legal Description): Sec 12, T17N, R15W
4. County: Caddo State: Louisiana
5. SIC Classification: 4939

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Treated sewage from 25 houses.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 33,216 gpd
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: Nacatoch, Cretaceous 954 ft.
7. Date Injection Began: (Day) (Month) (Year) 62
8. Total Volume Injected to Date: 100,000,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Nacatoch	
(2) Depth (Ft.)	960	
(3) Thickness (Ft.)	50	500
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %	23	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	shale

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Treated Waste

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			8	300
Intermediate			4-1/2	960
Injection		Stainless steel	2	1027-977
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 8 inch casing - cemented to surface; 4-1/2 inch casing - cemented to surface.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Slotted liner 972 - 1027 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

   A. Monitoring Devices and Data: ______________________________

   B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

   C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

   A. Construction Requirements: ______________________________

   B. Monitoring Requirements: ______________________________

   C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: LA-60

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: Union Carbide
Taft, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 31°21'00"/91°18'00"
3. Well Location (Legal Description): Sec 42, T13S, R20E
4. County: St Charles State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: NaCl, amines, NaOH, phenol, and chlorinated hydrocarbons
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 6700 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-60

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

WIC LA-60

3. Toxicity: ____________________

4. Reactivity with Surface Equipment Components: ____________________

5. Degradability Level and Rate: ____________________

6. Biological Level at Injection and Estimated Biological Level After Injection: ____________________

7. Pre-injection Waste Treatment: ____________________

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: ____________________

3. Well Head Equipment (Name and Models): ____________________

4. Packers, Centralizers, and Other Subsurface Equipment: ____________________

5. Bottom Hole Completion: ____________________

6. Hydraulic Fracturing, Acidizing Programs, etc.: ____________________

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: ____________________

2. Filters: ____________________

WIC LA-60

3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) __________ Average __________ Maximum __________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) __________ Average __________ Maximum __________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

3. Annual Volume Injected, gal.
A. 19__ __________ B. 19__ __________ C. 19__ __________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: __________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: __________

2. Contingency Plan for Well Failure During Operation: __________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: LA-61

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Ethyl Corp. Hydrocarbon Operation
451 Florida St. - Baton Rouge, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec 27, T8S, R11E
4. County: N/A State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chlorinated hydrocarbons, heavy solvents, aqueous chlorinated wastes, crude polymer oil, and light solvent wastes.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 4 gpm
4. Injection Pressure: Vacuum
5. Total Depth of Well: 9200 ft.
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) 20 (Month) 07 (Year) 71
8. Total Volume Injected to Date: 1,520,000 (7/5/72) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC LA-61

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	8950	
(3) Thickness (Ft.)	300	
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chlorinated hydrocarbons, solvents, polymers

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

WIC LA-61

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	casing		
Intermediate	18-1/2	54.5#	13-3/8	1838
	12-1/4	53.5# and 43.5#	9-5/8	8939
Injection	8-1/2	33.7#	7-5/8	9213
Other			4-1/2	9000

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: Block squeesed HET zone, squeezed 400 sks at 3320 ft.; 13-3/8 inch casing - 1700 sks; 9-5/8 inch casing - 830 sks; 7-5/8 inch casing - 295 sks

3. Well Head Equipment (Name and Models): 4000# test Gray well head assembly; 13-3/8" x 9-5/8" x 4-1/2" type "E" assembly, 2000# maximum working pressure.

4. Packers, Centralizers, and Other Subsurface Equipment: Baker model F.A. packer.

5. Bottom Hole Completion: Perforated 9100 - 9150 ft, 4 holes/ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized w/4500 gal. 31% HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC LA-61

3. Pumps: ______

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______

B. Sampling Frequency and Water Quality Parameters Measured: ______

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects

A. Construction Requirements: ______

B. Monitoring Requirements: ______

C. Restrictions of Operation Procedures: ______

Well Id. Code: LA-62

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: Uniroyal Corp.
Geismar, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°12'10"/91°01'00"
3. Well Location (Legal Description): Sec 11, T10S, R2E
4. County: Ascension State: Louisiana
5. SIC Classification: N/A

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone:
3700 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC LA-62

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

WIC LA-62

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC LA-62

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-63

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: Monsanto Chemical Co.
Luling, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 29°55'20"/90°21'30"
3. Well Location (Legal Description): Sec 36, T13S, R21E
4. County: St. Charles State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 3400 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-63

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: ______

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: ______

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: ______

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): ______

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: ______
   B. Conc. Dissolved Solids, mg/l: ______
   C. Specific Gravity: ______
   D. Temperature: ______
   E. pH: ______

WIC LA-63

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-64

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: Monsanto Chemical Co.
Luling, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 29°55'20"/90°21'30"
3. Well Location (Legal Description): N/A
4. County: St. Charles State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone:
   3400
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

WIC LA-64

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

(c)

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3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-65

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP **Operational Status:** PND
Operating Company Name and Address: Shell Chemical Co., Norco Refinery
Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°30'00"/90°25'10"
3. Well Location (Legal Description): Sec 3, T12S, R8E
4. County: St. Charles State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Acrolein, unsaturated organics, polymers
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 1900 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-65

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

3. **Toxicity:**

4. **Reactivity with Surface Equipment Components:**

5. **Degradability Level and Rate:**

6. **Biological Level at Injection and Estimated Biological Level After Injection:**

7. **Pre-injection Waste Treatment:**

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC LA-65

3. Pumps: ______

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	______	Average	______	Maximum	______
"	______		______		______
"	______		______		______
"	______		______		______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______

B. Sampling Frequency and Water Quality Parameters Measured: ______

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects

A. Construction Requirements: ______

B. Monitoring Requirements: ______

C. Restrictions of Operation Procedures: ______

Well Id. Code: LA-66

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND
Operating Company Name and Address: Shell Chemical Co., Norco Refinery
Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°30'00"/90°25'10"
3. Well Location (Legal Description): Sec 3, T12S, R8E
4. County: St. Charles State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Acrolein, unsaturated organics, polymers
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: 1900 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l:
   - B. Conc. Dissolved Solids, mg/l:
   - C. Specific Gravity:
   - D. Temperature:
   - E. pH:

WIC LA-66

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC LA-66

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-67

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: American Cyanamid, Frontier Plant
Ama, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec 3, T13S, R22E
4. County: Jefferson State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sulfates, ammonia, cyanide
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone:
   4600 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC LA-67

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

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3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) __________ Average __________ Maximum __________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) __________ Average __________ Maximum __________
" __________ __________ __________
" __________ __________ __________
" __________ __________ __________

3. Annual Volume Injected, gal.
A. 19__ __________ B. 19__ __________ C. 19__ __________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-68

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Universal Oil Products Company
P.O. Box 1566 - Shreveport, Louisiana

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** 32°37'/93°55'
3. **Well Location (Legal Description):** Sec 20, T19N, R15W
4. **County:** Caddo **State:** Louisiana
5. **SIC Classification:** 2911

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Wastes produced from the manufacture of synthetic catalysts for the petroleum refining industry.
2. **Date Well Permitted:** 9/2/72 **Completed:**
3. **Injection Rate:** 185,000,000 gpy
4. **Injection Pressure:** 425 psig
5. **Total Depth of Well:** 1111 ft.
6. **Name, Age, and Depth of Injection Zone:** Nacatoch, Cretaceous 985 ft.
7. **Date Injection Began: (Day)** 05 **(Month)** 10 **(Year)** 72
8. **Total Volume Injected to Date:** 250,000,000 **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** None

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wilcox	Tertiary	0	810	sand, shale
Arkadelphia	Cretaceous	810	160	shale
Nacatoch	Cretaceous	970	365	sand, lime, shale

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Nacatoch	Arkadelphia
(2) Depth (Ft.)	970	810
(3) Thickness (Ft.)	80	160
(4) Formation Fluid Pressure, psi	460	
(5) Lithostatic Pressure, psi		800
(6) Hydrofracturing Pressure, psi	800	800
(7) Age of Unit	Cretaceous	Cretaceous
(8) Porosity %	30	42
(9) Permeability, millidarcies	1000	0
(10) Reservoir Temperature, °C	27°	27°
(11) Character and Areal Distribution	sand, lime, shale extensive	shale extensive

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Other Universal Oil disposal wells.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chlorides, chromium, sulfate, sodium

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 0
   B. Conc. Dissolved Solids, mg/l: 3000 - 5000
   C. Specific Gravity: 1.05
   D. Temperature: 100° F
   E. pH: 8.0

WIC LA-68

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Slightly corrosive to carbon steel.

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: BOD approximately 1000 ppm at injection.

7. Pre-injection Waste Treatment: pH control, septic tank treatment of sewage.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	20	84# K-55	16	997.71
Intermediate	13-7/8	40.5# K-55	10-3/4	1101.63
Injection		36# K-55 and N-80	8-5/8	988.85
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 16 inch casing - 900 sks 50-50 Pozmix - Class A w/ 2% $CaCl_2$ + 200 sks Class A; 10-3/4 inch casing - 660 sks 50-50 Pozmix - class A cement.

3. Well Head Equipment (Name and Models): Larkin model 92 well head

4. Packers, Centralizers, and Other Subsurface Equipment: Injection tubing bottom hole packer - Brown pin type squash packer 8-5/8" x 10-3/4". Centralizers every other joint.

5. Bottom Hole Completion: Perforations 70 by 1" dia. shots from 1016 to 1042 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 2000 gal. inhibited 15% HF.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC LA-68

3. **Pumps:** N/A

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	10/72-3/73	**Average**	400	**Maximum**	700
"					
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	10/72-3/73	**Average**	425	**Maximum**	475
"					
"					
"					

3. **Annual Volume Injected, gal.**

A. 1972 46,000,000 B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Monitor annulus for leaks.

B. **Sampling Frequency and Water Quality Parameters Measured:** Continuous quality samples.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** Monthly

2. **Contingency Plan for Well Failure During Operation:** Cease operations.

3. **Regulatory Aspects**

A. **Construction Requirements:** N/A

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** N/A

Well Id. Code: LA-69

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Shell Chemical Company
Norco, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 30°00'/90°24'
3. Well Location (Legal Description): N/A
4. County: Norco State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: 220 gpm
4. Injection Pressure: 150 psi
5. Total Depth of Well: 3500 ft. PBTD 3340 ft.
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

WIC ______ LA-69

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: ______

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: ______

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: ______

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): ______

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: ______
   B. Conc. Dissolved Solids, mg/l: ______
   C. Specific Gravity: ______
   D. Temperature: ______
   E. pH: ______

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		55#	20	106
Intermediate	17-1/2	48# H-40	13-3/8	1019
	12-1/4	36# K-55	9-5/8	3530
Injection		4.7# J-55R2	2-3/8	3179
Other		23#	7	2111

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 13-3/8 inch casing - 925 sks cement; 9-5/8 inch casing - 1450 sks cemented bottom to 1019 ft.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 7 inch packer at 2111 ft., type LH; mule shoe at 3179 ft.

5. Bottom Hole Completion: Perforations: 3286 to 3316 ft., 3330 to 3340 ft. with 3/4" diameter holes, two per foot.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

WIC LA-69

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: LA-70

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND
Operating Company Name and Address: Texaco Refinery
Union Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec 12, T11S, R3S
4. County: St. James State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

WIC LA-70

B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

WIC ______LA-70______

3. Toxicity: ____

4. Reactivity with Surface Equipment Components: ____________

5. Degradability Level and Rate: ________________________

6. Biological Level at Injection and Estimated Biological Level After Injection: ________________________

7. Pre-injection Waste Treatment: ________________________

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: ____________

3. Well Head Equipment (Name and Models): ________________________

4. Packers, Centralizers, and Other Subsurface Equipment: ____________

5. Bottom Hole Completion: ________________________

6. Hydraulic Fracturing, Acidizing Programs, etc.: ____________

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: ________________________

2. Filters: ____

WIC LA-70

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ____________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-71

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: Union Carbide
Taft, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec 42, T13S, R20E
4. County: St. Charles State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi*		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: ____

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area: ____

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: ____

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): ____

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: ____
   - B. Conc. Dissolved Solids, mg/l: ____
   - C. Specific Gravity: ____
   - D. Temperature: ____
   - E. pH: ____

(b)

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps: ______

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ______	Average ______	Maximum ______
" ______	______	______
" ______	______	______
" ______	______	______

3. Annual Volume Injected, gal.
A. 19__ ______ B. 19__ ______ C. 19__ ______

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______

B. Sampling Frequency and Water Quality Parameters Measured: ______

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______

2. Contingency Plan for Well Failure During Operation: ______

3. Regulatory Aspects

A. Construction Requirements: ______

B. Monitoring Requirements: ______

C. Restrictions of Operation Procedures: ______

Well Id. Code: LA-72

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND
Operating Company Name and Address: Union Carbide
Taft, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec 42 T13S, R20E
4. County: St. Charles State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

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3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

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3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	________	Average	________	Maximum	________
"	________		________		________
"	________		________		________
"	________		________		________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	________	Average	________	Maximum	________
"	________		________		________
"	________		________		________
"	________		________		________

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: LA-73

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: AFP Operational Status: PND

Operating Company Name and Address: E. I. DuPont de Nemours, Inc. Pontchartrain Works, LaPlace, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec 90, T11S, R70E
4. County: St. John the Baptist State: Louisiana
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: N/A
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: N/A
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

3. Toxicity:

4. Reactivity with Surface Equipment Components:

5. Degradability Level and Rate:

6. Biological Level at Injection and Estimated Biological Level After Injection:

7. Pre-injection Waste Treatment:

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:

3. Well Head Equipment (Name and Models):

4. Packers, Centralizers, and Other Subsurface Equipment:

5. Bottom Hole Completion:

6. Hydraulic Fracturing, Acidizing Programs, etc.:

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines:

2. Filters:

WIC LA-73

3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ __________ B. 19__ __________ C. 19__ __________

VIII. SAFETY INFORMATION

1. Monitoring Program

   A. Monitoring Devices and Data: ____________________

   B. Sampling Frequency and Water Quality Parameters Measured: ____________________

   C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

   A. Construction Requirements: ____________________

   B. Monitoring Requirements: ____________________

   C. Restrictions of Operation Procedures: ____________________

Well Id. Code: LA-75

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: DAP Operational Status: DN
Operating Company Name and Address: Uniroyal Chemical Co.
P.O. Box 397, Geisman, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): Sec 11, T10S, R2E
4. County: Ascension State: Louisiana
5. SIC Classification: 3099

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Sodium sulfate, sodium chloride, ammonium sulfate ammonium chloride, ferric sulfate, sodium hydroxide, sulfonic acid, methanol, ketones, aliphatic compounds, amines, chromates, chromates, dipherly oxides
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 3863 ft.
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids:

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character

4. Mineral Resources in Area:

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area:

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity):

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l:
   C. Specific Gravity:
   D. Temperature:
   E. pH:

(b)

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	17-1/2	48# K-55	13-3/8	884
Intermediate	12-1/4	36# K-55	9-5/8	3501
		24#	6-5/8	3411-3770
Injection	15	23# K-55	7	3402
Other		wire wrapped liner		

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon:
13-3/8 " casing - 790 sks cement; 9-5/8" casing - 1000 sks cement
6-5/8" casing - 429 sks cement

3. Well Head Equipment (Name and Models): 13-3/8 x 9-5/8 x 7 Gray E. TBG Head

4. Packers, Centralizers, and Other Subsurface Equipment: Packer at 3402 - 3411

5. Bottom Hole Completion: 0.030 screen, underreamed hole below 9-5/8" casing to 15" hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: ____
____

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ____________ Average ____________ Maximum ____________
" ____________ ____________ ____________
" ____________ ____________ ____________
" ____________ ____________ ____________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ____________ Average ____________ Maximum ____________
" ____________ ____________ ____________
" ____________ ____________ ____________
" ____________ ____________ ____________

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____
____

B. Sampling Frequency and Water Quality Parameters Measured: ____________
____

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________
____

2. Contingency Plan for Well Failure During Operation: ____________________
____

3. Regulatory Aspects

A. Construction Requirements: ____
____

B. Monitoring Requirements: ____
____

C. Restrictions of Operation Procedures: ____
____
____

Well Id. Code: LA-76

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** DN
Operating Company Name and Address: Universal Oil Products Company
Brian, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 10 (Month) 09 (Year) 73
2. Latitude and Longitude: 32°37'/93°55'
3. Well Location (Legal Description): N 1/2, Sec 20, T19N, R15W
4. County: Caddo State: Louisiana
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes produced from the manufacture of synthetic catalysts for the petroleum refining industry.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 1081 ft.
6. Name, Age, and Depth of Injection Zone: Nacatoch, Cretaceous 985 ft.
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: None

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Wilcox	Tertiary	0	785	Sand, shale
Arkadelphia	Cretaceous	785	155	shale
Nacatoch	Cretaceous	940	365	sand, limestone, shale

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Nacatoch	Arkapelphia
(2) Depth (Ft.)	940	785
(3) Thickness (Ft.)	75	155
(4) Formation Fluid Pressure, psi	460	
(5) Lithostatic Pressure, psi		800
(6) Hydrofracturing Pressure, psi		800
(7) Age of Unit	Cretaceous	Creaaceous
(8) Porosity %	30	42
(9) Permeability, millidarcies	1000	0
(10) Reservoir Temperature, °C	26°	26°
(11) Character and Areal Distribution	sand, limestone shale extensive	shale extensive

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Five disposal wells.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sodium, calcium, chloride chromium

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 0
   B. Conc. Dissolved Solids, mg/l: 3000 - 5000
   C. Specific Gravity: 1.05
   D. Temperature: 100° F
   E. pH: 8.0

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Slightly corrosive to carbon steel

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Filtration

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	10	28# J-55	8-5/8	156
Intermediate	9	26# J-55	7	1081
Injection		27# A-53B	5-9/16	957
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 350 sks of class H cement

3. Well Head Equipment (Name and Models): Oil Center Tool Co. modified "THA" well head packoff, 5-9/16" x 7"

4. Packers, Centralizers, and Other Subsurface Equipment: Injection tubing bottom hole packer - Brown pin type squash packer, 5-5/8" x 7". Centralizers at everyother joint

5. Bottom Hole Completion: Perforations 70 - 1" dia. shots from 983 to 1009 feet.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 2000 gal. 15% inhibited HF.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
N/A		
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
N/A		
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Monitor for leaks in annulus.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: Cease operation. rework or plug back well. Switch to a stand-by well.

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: LA-77

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: DN

Operating Company Name and Address: Delta Iron Works,
Industrial Blvd, Houma, Louisiana

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 03 (Month) 08 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): NW 1/4, Sec 12, T17S, R17E
4. County: Terrebone State: Louisiana
5. SIC Classification: 7500

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Gas freeing of oil transport barges.
2. Date Well Permitted: 11/68 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 3045'
6. Name, Age, and Depth of Injection Zone: N/A
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
	Miocene	0	3045	sand, shale

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name		
(2) Depth (Ft.)	2215	
(3) Thickness (Ft.)	75	
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Miocene	
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sand	

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: N/A

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): N/A

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15"	40.5# J-55	10-3/4	3045
Intermediate		26.4# -55	7-5/8	1023
Injection		6.5# J-55	2-7/8	2214
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4" casing - 1850 sks class A

3. Well Head Equipment (Name and Models): 10-3/4" x 7-5/8" casing hanger; 7-5/8" x 2-7/8" casing head; 10-3/4 x 7-5/8" casing head; 10-3/4" x 7-5/8" packer; 7-5/8" x 2-7/8" packer.

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Perforated 10-3/4" casing from 2220 - 2245 w/100 holes.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

(c)

WIC LA-77

3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: MI-1

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP

Operating Company Name and Address: Marathon Oil Co. (Old Dutch Refinery Co.)
Muskegon, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): SE 1/4, SW 1/4, SE 1/4, Sec 26, T10N, R16W
4. County: Muskegon State: Michigan
5. SIC Classification: 2911

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Refinery water and surface flood waters.
2. Date Well Permitted: N/A Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 2346 ft.
6. Name, Age, and Depth of Injection Zone: Traverse-Detroit River, Devonian 1758 ft.
7. Date Injection Began: (Day) (Month) 09 (Year) 48
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Coldwater	Devonian	673	885	limestone
Traverse	Devonian	1758	372	limestone
Dundee	Devonian	2130		limestone
Detroit River	Devonian			dolomite

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Traverse-Detroit R.	Coldwater
(2) Depth (Ft.)	1758	673
(3) Thickness (Ft.)	1643	885
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian	Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone, dolomite; extensive	limestone extensive

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Oil and gas pools located near the well site.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Refinery waste.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Settling and skimming.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		42#	10	440
Intermediate		30#	8	605
		18#	6	703
Injection		14#	5	1758
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 500 barrel underground tank and a 5000 barrel settling and skimming tank.

2. Filters: Strawboxes

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3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ________	Average ________	Maximum ________
" ________	________	________
" ________	________	________
" ________	________	________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ________	Average ________	Maximum ________
" ________	________	________
" ________	________	________
" ________	________	________

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: MI-2

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: Park, Davis, and Company
182 Howard Ave. - Holland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 42°47'55"/86°06'59"
3. Well Location (Legal Description): SW 1/4, Sw 1/4, SW 1/4, Sec 20, T5N, R15W
4. County: Ottawa State: Michigan
5. SIC Classification: 2830

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: The waste is derived from the manufacture of pharmaceuticals.
2. Date Well Permitted: Completed: 4/21/51
3. Injection Rate: 6,000,000 gpy
4. Injection Pressure: 440 psig
5. Total Depth of Well: 1635 ft.
6. Name, Age, and Depth of Injection Zone: Traverse, Devonian 1380 ft.
7. Date Injection Began: (Day) (Month) 05 (Year) 51
8. Total Volume Injected to Date: 79,314,740 (1/73) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: None

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	115	sand, gravel, clay
Coldwater	Mississippian	115	448	dolomite
Ellsworth	Mississippian	563	637	shale
Antrim	Mississippian	1200	180	shale
Traverse	Devonian	1380	254	shale, limestone

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Traverse	Coldwater-Antrim
(2) Depth (Ft.)	1380	115
(3) Thickness (Ft.)	254	1250
(4) Formation Fluid Pressure, psi	679	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian	Mississippian
(8) Porosity %	15	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone	dolomite, shale

C. Chemical Characteristics of Formation Fluids: Chloride = 152,000 ppm; Fe = 20 ppm; TDS = 235,950 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	115	variable	sand, gravel	potable

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Four deep disposal wells and four shallow water wells within 1-1/2 miles.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Pharmaceutical wastes including: ammonia, bromide, and organics (BOD = 45,000 ppm)

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 0
   B. Conc. Dissolved Solids, mg/l: 60,000
   C. Specific Gravity: 1.00 to 1.04
   D. Temperature: ambient
   E. pH: 3.7

3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Corrosion rates minor. Injection string replaced in 11/66 showed approximately 1/4 loss in weight.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** N/A

7. **Pre-injection Waste Treatment:** Filtration, aeration, settling, and pH adjustment. Precipitation and filtration of sulfates, phosphates, and aluminum.

V. WELL DESIGN AND CONSTRUCTION

1. **Casing and Tubing**

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		42#	10-1/2	125
Intermediate	8-3/4	17#	7	1435
Injection				
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 255 sks standard cement to surface; Halliburton acid proof in bottom 100 ft.

3. **Well Head Equipment (Name and Models):** Norris Hinderliter 5733 tubing head; 2" gate valve Orbit 1434; 2" cast steel swing check

4. **Packers, Centralizers, and Other Subsurface Equipment:** Five centralizers; Lane wells BOC-23 Hookwall packer; Howco float collar; Howco guide shoe.

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** Wooden settling and aging tanks; 2" piping to well.

2. **Filters:** Wooden sand filters 30 gpm rate; Emico Rotary precoat filter 60 gpm rate.

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3. **Pumps:** John Bean triples 20 HP.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	1952	**Average**	3	**Maximum**	10
"	1958		8		10
"	1962		4		10
"	1972		12		40

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	1952	**Average**	150	**Maximum**	168
"	1958		240		280
"	1962		282		335
"	1972		456		520

3. **Annual Volume Injected, gal.**
A. 1972 6,136,440 B. 1971 5,001,960 C. 1970 6,329,280

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Taylor recorders on injection string pressure and on annulus pressure. Time totals are on pump operation.

B. **Sampling Frequency and Water Quality Parameters Measured:** Daily - pressure, flow, and pump hours.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** 340,000 gal. storage tank; $CaCO_2$ on hand to drown well.

3. **Regulatory Aspects**

A. **Construction Requirements:** Follow design.

B. **Monitoring Requirements:** Injection and annulus pressures, hours of pump operation, volume pumped, monthly summary of daily data submitted to Michigan WRC.

C. **Restrictions of Operation Procedures:** Provisions of rules No. 315 Public Acts of 1969 - supervised by Michigan State Geologist. Monitor well pressure and rates. Notification of any abnormalities.

Well Id. Code: MI-3

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Park, Davis, and Company
182 Howard Ave. - Holland, Michigan

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data:** (Day) 01 (Month) 06 (Year) 73
2. **Latitude and Longitude:** 42°47'54"/86°07'00"
3. **Well Location (Legal Description):** SW 1/4, SW 1/4, SW 1/4, Sec 20, T5N, R15W
4. **County:** Ottawa **State:** Michigan
5. **SIC Classification:** 2830

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** The waste is derived from the manufacture of pharmaceuticals - ammonia, bromide, sodium, acetate, chloride, and organics.
2. **Date Well Permitted:** 8/31/56 **Completed:**
3. **Injection Rate:** 10,000,000 gpy
4. **Injection Pressure:** 490 psig
5. **Total Depth of Well:** 1946 ft.
6. **Name, Age, and Depth of Injection Zone:** Detroit River, Devonian 1649 ft.
7. **Date Injection Began:** (Day) (Month) 10 (Year) 56
8. **Total Volume Injected to Date:** 133,457,743 (1/73) (Gallons)
9. **Date Injection Ceased:** (Day) (Month) (Year)
10. **Previous Mode of Disposal:** Another deep well.

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	115	sand, gravel, clay
Coldwater	Mississippian	115	448	dolomite
Ellsworth	Mississippian	563	637	shale
Antrim	Mississippian	1200	180	shale
Traverse	Devonian	1380	254	shale, limestone
Detroit River	Devonian	1634		limestone, dolomite

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Detroit River	Coldwater-Antrim
(2) Depth (Ft.)	1649	115
(3) Thickness (Ft.)	297	1250
(4) Formation Fluid Pressure, psi	647	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian	Mississippian
(8) Porosity %	15	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone, dolomite widespread	carbonates, shale widespread

C. Chemical Characteristics of Formation Fluids: TDS = 235,950 ppm; Cl^- = 152,000 ppm

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	115	variable	sand, gravel	good

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Several other injection wells in the area.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chemical wastes including: ammonia, bromide, sodium, acetate, chloride, and organics from the manufacture of pharmaceuticals.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l:
   - B. Conc. Dissolved Solids, mg/l: 60,000
   - C. Specific Gravity: 1.00 - 1.04
   - D. Temperature: ambient
   - E. pH: 3.7

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: Corrosive - injection string replaced 10/64.

5. Degradability Level and Rate: Can be degraded biologically with proper filtering or lagoon

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: Settling and filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-3/4	32# H-40	10-3/4	152
Intermediate	9	23# J-55	7	1649
Injection		4.75# EUE J-55	2-3/8	
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 60 sks regular cement and Dowflake; 7 inch casing - 270 sks w/ 50 gallons Dowell D-5 in last 37 sks.

3. Well Head Equipment (Name and Models): Type H/ 4000# Norris Hinderliter tubing head; 2" Gate valve orbit 1434; 2" cast steel swing check.

4. Packers, Centralizers, and Other Subsurface Equipment: 8 centralizers; Lane wells BOC-23, 7" Hookwall packer at 1642 ft.; Howco float collar; Howco guide shoe, type B.

5. Bottom Hole Completion: Open hole.

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Settling tanks and a surge tank; 2" piping to the well.

2. Filters: Permutite filter about 30 gpm, sand filters; Eimco rotaty precoat filter - maximum rate 60 BPM

3. **Pumps:** John Bean triplex, 20 gpm, 20 HP, float control; Farris packed lever relief valve 700 psi.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	Average	Maximum
1957	1.5	10
1966	6	40
1969	30	40
1972	19	40

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	Average	Maximum
1957	158	205
1966	378	485
1969	552	650
1972	492	660

3. **Annual Volume Injected, gal.**

A. 1972 10,138,800 B. 1971 15,250,860 C. 1970 16,526,460

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Taylor recorders on injection string pressure and on annulus pressure. Time totals on pump operation.

B. **Sampling Frequency and Water Quality Parameters Measured:** Daily - deep well pressure, flow and pump hours.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** 340,000 gal. storage tank, $CaCO_3$ on hand to drown well.

3. **Regulatory Aspects**

A. **Construction Requirements:** Follow design features.

B. **Monitoring Requirements:** Injection and annulus pressures, hours of pump operation and volume; Monthly summary to Michigan WRC. Required to report abnormalities.

C. **Restrictions of Operation Procedures:** Provisions of rules of No. 315 Public Acts of 1969.

Well Id. Code: MI-4

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP

Operating Company Name and Address: Hooker Electro-chemical Company
Montague, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): SE 1/4, NW 1/4, SE 1/4, Sec 30, T12N, R17W
4. County: Muskegon State: Michigan
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant wastes.
2. Date Well Permitted: 1953 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 2066 ft.
6. Name, Age, and Depth of Injection Zone: Traverse, Devonian 1703
7. Date Injection Began: (Day) (Month) 04 (Year) 56
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) 18 (Month) 06 (Year) 69
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	355	clay, sand, gravel
Coldwater	Mississippian	355	563	shale
Ellsworth	Mississippian	918	564	shale
Antrim	Mississippian	1482	138	shale
Traverse	Devonian	1620	446	limestone, shale

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Traverse	Coldwater-Antrim
(2) Depth (Ft.)	1703	355
(3) Thickness (Ft.)	363	1350
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian	Mississippian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone widespread	carbonates, shale widespread

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	355	variable	sand, gravel	good

4. Mineral Resources in Area: Several small oil and gas pools in the vicinity of the well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sodium sulfate, sodium chloride, and calcium sulfate.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. Toxicity: None

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: None

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			18	395
Intermediate		54#	13-3/8	1703
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 18 inch casing - 650 sks; 13-3/8 inch casing - 1150 sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 5000 gal. at 1800 ft. to 2066 ft.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.

A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: MI-5

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** NOP

Operating Company Name and Address: Hooker Electro-chemical Company
Montigue, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): SW 1/4, NE 1/4, NE 1/4, Sec 31, T12N, R17W
4. County: Muskegon State: Michigan
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant wastes.
2. Date Well Permitted: 1956 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 2083 ft.
6. Name, Age, and Depth of Injection Zone: Traverse, Devonian 1622 ft.
7. Date Injection Began: (Day) (Month) 05 (Year) 56
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) 06 (Year) 68
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	300	sand, gravel
Marshall	Mississippian	300	590	sandstone
Coldwater	Mississippian	890	524	shale
Antrim	Mississippian	1414	206	shale
Traverse	Devonian	1622	442	limestone, shale
Bell	Devonian	2064		shale

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Traverse	Coldwater-Antrim
(2) Depth (Ft.)	1622	890
(3) Thickness (Ft.)	442	730
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	Mississippian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone	shale

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	300	variable	sand, gravel	good
Marshall	300	590		sandstone	

4. Mineral Resources in Area: Several small oil and gas pools.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Sodium sulfate , sodium chloride, and calcium sulfate.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: None

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: N/A

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			10-3/4	385
Intermediate			7	1996
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 200 sks; 7 inch casing - 425 sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Perforated 1962 ft to 1972 ft. (30 holes).

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 5000 gal. at 1996 ft. to 2068 ft.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) ________ Average ________ Maximum ________
" ________ ________ ________
" ________ ________ ________
" ________ ________ ________

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) ________ Average ________ Maximum ________
" ________ ________ ________
" ________ ________ ________
" ________ ________ ________

3. Annual Volume Injected, gal.
A. 19__ ________ B. 19__ ________ C. 19__ ________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ____________________

B. Sampling Frequency and Water Quality Parameters Measured: ________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ________

2. Contingency Plan for Well Failure During Operation: ________

3. Regulatory Aspects

A. Construction Requirements: ____________________

B. Monitoring Requirements: ____________________

C. Restrictions of Operation Procedures: ____________________

Well Id. Code: MI-6

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: NOP
Operating Company Name and Address: Reichhold Chemical, Inc.
Ferndale, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): NW 1/4, SW 1/4, NE 1/4, Sec 27, T1N, R11E
4. County: Oakland State: Michigan
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical waste - phenol wastes.
2. Date Well Permitted: 9/53 Completed:
3. Injection Rate: 131 gpm
4. Injection Pressure: 100 psi
5. Total Depth of Well: 1053 ft.
6. Name, Age, and Depth of Injection Zone: Detroit River and Sylvania, Devonian 626 ft.
7. Date Injection Began: (Day) (Month) 09 (Year) 53
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year) 57
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	128	sand, gravel, clay
Antrim	Devonian	128	94	shale
Traverse	Devonian	222	378	limestone
Dundee	Devonian	600	26	limestone
Detroit River	Devonian	626	291	dolomite
Sylvania	Devonian	917	78	sandstone

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Detroit R.-Sylvania	Traverse-Dundee
(2) Depth (Ft.)	626 917	222
(3) Thickness (Ft.)	291 78	471
(4) Formation Fluid Pressure, psi	2030	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 pst/ ft est.	
(7) Age of Unit	Devonian	Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	dolomite, sandstone	shale, limestone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Phenols

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. **Toxicity:** Total dose of 1.5 grams of phenol may be fatal to humans.

4. **Reactivity with Surface Equipment Components:** None

5. **Degradability Level and Rate:** Phenol may be biologically degraded.

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Filtration.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			8-1/4	130
Intermediate			6-5/8	693
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 500 gallons at 693-1053 ft.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. **Pumps:** Two Wheatly triplex pumps w/ 2-1/2" pistons.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s) N/A	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s) N/A	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: MI-7

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O
Operating Company Name and Address: UpJohn Company
Kalamazoo, Michigan

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** N/A
3. **Well Location (Legal Description):** SW 1/4, SE 1/4, NE 1/4, Sec 14, T3S, R11W
4. **County:** Kalamazoo **State:** Michigan
5. **SIC Classification:** 4930

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Effluent from the manufacture of cortical steroid.
2. **Date Well Permitted:** 5/54 **Completed:**
3. **Injection Rate:** 60,000 gpd
4. **Injection Pressure:** 220 psi
5. **Total Depth of Well:** 1532 ft.
6. **Name, Age, and Depth of Injection Zone:** Traverse-Monroe, Devonian 1220 ft.
7. **Date Injection Began: (Day)** **(Month)** 05 **(Year)** 54
8. **Total Volume Injected to Date:** 44,670,592 **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)**
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	350	sand, gravel, clay
Coldwater	Mississippian			shale
Antrim	Devonian			shale
Traverse	Devonian	1220	170	limestone
Dundee	Devonian	1390	55	limestone
Monroe	Devonian	1532		dolomite

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Traverse-Monroe	Coldwater-Antrim
(2) Depth (Ft.)	1220	350
(3) Thickness (Ft.)	312	940
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian	Miss. & Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	limestone, dolomite	shale, limestone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	350	extensive	sand, gravel	fresh

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Soluble organic solvents: alcohols, ketones, esters, ethers, dissolved inorganic salts and acids. 2000 - 10,000 ppm BOD
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l: 5000 - 8000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 4.0 - 4.5

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3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Filtration, clarification, and pH adjustment

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		42#	10	352
Intermediate		17#	7	1290
Injection		Tubing	2-1/2	1295
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 5 Centralizers on 7 inch casing; Hookwall neoprene packer at 1200 ft.

5. Bottom Hole Completion: Open hole - 200 ft.

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 2 surge tanks - 45,000 gal. each; 1 - 25,000 gal. mixing tank; and one 65,000 gal. clarifier.

2. Filters: Niagara polishing filter.

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3. **Pumps:** One injection pump and one booster pump.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	1954	Average	250	Maximum	
"	1964		211		320
"	1965		180		400
"	1966		180		400

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Volume and pressure monitors.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and manitained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: Pressure is monitored with continuous pressure recorders.

C. Restrictions of Operation Procedures: Surface pressure is limited to 1250 psi and the rate is limited to 300,000 gpd.

Well Id. Code: MI-8

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0

Operating Company Name and Address: UpJohn Company
Kalamazoo, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): SW 1/4, SW 1/4, NW 1/4, Sec 14, T3S, R11W
4. County: Kalamazoo State: Michigan
5. SIC Classification: 2830

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Wastes from pharmaceutical products and cortical steroid wastes.
2. Date Well Permitted: 5/54 Completed:
3. Injection Rate: 60,000 gpd
4. Injection Pressure: 220 psi
5. Total Depth of Well: 1475 ft.
6. Name, Age, and Depth of Injection Zone: Traverse-Monroe, Devonian 1220 ft.
7. Date Injection Began: (Day) (Month) 05 (Year) 54
8. Total Volume Injected to Date: 44,670,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	350	sand, gravel, clay
Coldwater	Mississippian	350		shale
Antrim	Devonian			shale
Traverse	Devonian	1220	170	limestone
Dundee	Devonian	1390	142	limestone
Monroe	Devonian	1532		dolomite

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

		Injection Unit	Confining Bed
(1)	Name	Traverse-Monroe	Coldwater-Antrim
(2)	Depth (Ft.)	1220	350
(3)	Thickness (Ft.)	312	940
(4)	Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5)	Lithostatic Pressure, psi	1.0 psi/ft est.	
(6)	Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7)	Age of Unit	Devonian	Miss. & Devonian
(8)	Porosity %		
(9)	Permeability, millidarcies		
(10)	Reservoir Temperature, °C		
(11)	Character and Areal Distribution	limestone, dolomite	shale

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	350	extensive	sand, gravel	fresh

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Soluble organics solvents: alcohols, ketones, esters, ethers and ethers; inorganic salts and acids; BOD = 2,000 - 10,000 ppm

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l:
   B. Conc. Dissolved Solids, mg/l: 5000-8000
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: 4.0 - 4.5

(b)

3. Toxicity: N/A

4. Reactivity with Surface Equipment Components: N/A

5. Degradability Level and Rate: N/A

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: Filtration, clarification, and pH adjustment

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		42#	10	352
Intermediate		17#	7	1290
Injection		Tubing	2-1/2	1295
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 7 inch casing - 395 sks cement.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 5 centralizers on 7 inch casing; Hookwall neoprene packer on 7 inch casing.

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 3000 gal. at 1276 ft. to 1476 ft.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 2 surge tanks - 45,000 gal. each; one 25,000 gal. mixing tank; and one 65,000 gal. clarifer

2. Filters: Niagara polishing filter.

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3. **Pumps:** One injection pump and one booster pump.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	1954	Average	250	Maximum	
"	1964		211		320
"	1965		180		400
"	1966		180		400

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Volume and pressure monitors.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: Pressure is monitored with continuous pressure recorders.

C. Restrictions of Operation Procedures: Surface pressures limited to 1250 psi and the rate is limited to 300,000 gpd.

Well Id. Code: MI-9

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** NOUP
Operating Company Name and Address: Dow Chemical Company, Bay Refining Div.

I. GENERAL IDENTIFICATION DATA

1. **Entry Date of Data: (Day)** 01 **(Month)** 06 **(Year)** 73
2. **Latitude and Longitude:** 43°38'30"/83°07'30"
3. **Well Location (Legal Description):** SW 1/4, NE 1/4, NE 1/4, Sec 15, T14N, R5E
4. **County:** Bay **State:** Michigan
5. **SIC Classification:** 2900

II. GENERAL DATA ON WELL SITE

1. **Type of Waste Injected:** Chemical plant waste
2. **Date Well Permitted:** **Completed:** 10/13/54
3. **Injection Rate:** 64,800 gpd
4. **Injection Pressure:** N/A
5. **Total Depth of Well:** 4710 ft.
6. **Name, Age, and Depth of Injection Zone:** Sylvania, Devonian 4425 ft.
7. **Date Injection Began: (Day)** **(Month)** **(Year)** 54
8. **Total Volume Injected to Date:** N/A **(Gallons)**
9. **Date Injection Ceased: (Day)** **(Month)** **(Year)** 67
10. **Previous Mode of Disposal:** N/A

III. GEOLOGIC INFORMATION

1. **Lithology and Stratigraphy**
   A. **Geological Description of Rock Units Penetrated by Well**

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	98	sand, clay
Saginaw	Pennsylvanian	98	326	sand, shale
Michigan Series	Mississippian	424	133	sandstone
Marshall	Mississippian	557	1234	sandstone
Berea	Mississippian	1791	171	sandstone
Antrim	Miss.-Dev.	1963	178	shale
Traverse-Detroit R.	Devonian	2041	2307	limestone, dolomite, shale
Sylvania	Devonian	4453		sandstone

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Sylvania	
(2) Depth (Ft.)	4425	300
(3) Thickness (Ft.)	285	4000
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Devonian	Miss. & Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	shale, carbonate, sandstone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Cuprous ammonium acetate, phenol, and caustic waste.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

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3. **Toxicity:** Threshold concentration of copper in domestic water supplies is 1.0 mg/l; phenol may be fatal with a total dose of 1.5 grams

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metallic components in caustic solution.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	14		14	97
Intermediate		14#	10-3/4	891
Injection			5	4125
Other		Tubing	2-1/2	

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: Six centralizers

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: ______________________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: ______________________________

B. Sampling Frequency and Water Quality Parameters Measured: ______________________________

C. Frequency of Measuring Water Levels and Hydrostatic Heads: ______________________________

2. Contingency Plan for Well Failure During Operation: ______________________________

3. Regulatory Aspects

A. Construction Requirements: ______________________________

B. Monitoring Requirements: ______________________________

C. Restrictions of Operation Procedures: ______________________________

Well Id. Code: MI-10

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Dow Chemical Company, Bay Refining Div.

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 43°38'18"/83°51'00"
3. Well Location (Legal Description): SW 1/4, SE 1/4, NE 1/4, Sec 10, T14N, R5E
4. County: Bay State: Michigan
5. SIC Classification: 2900

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical plant waste
2. Date Well Permitted: 9/59 Completed: 7/28/59
3. Injection Rate: 293,000 gpd
4. Injection Pressure: 1900 psi
5. Total Depth of Well: 4605
6. Name, Age, and Depth of Injection Zone: Sylvania, Devonian 4489 ft.
7. Date Injection Began: (Day) (Month) 09 (Year) 59
8. Total Volume Injected to Date: 18,248,880 (3/1/73) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Marshall	Mississippian	437		sandstone
Dundee	Devonian	2900		limestone
Detroit River	Devonian	3245		limestone
Sylvania	Devonian	4453		sandstone

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Sylvania	Dundee-Detroit R.
(2) Depth (Ft.)	4489	2900
(3) Thickness (Ft.)	126	1553
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Devonian	Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	limestone

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Some oil, gas and coal found in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Phenol water, 20% spent caustic, and acidic water.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: N/A
   - D. Temperature: N/A
   - E. pH: N/A

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3. **Toxicity:** Total dose of 1.5 grams of phenol may be fatal to humans.

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metallic components by exposure to caustic.

5. **Degradability Level and Rate:** None

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Settling

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface		40.5# H-40	10-3/4	891
Intermediate		23# J-55 CSG	7	4441
Injection		EUE tubing	3-1/2	4000
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 600 sks; 7 inch casing - 1050 sks.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** Six centralizers; Baker Model B packoff shoe at 4441 ft.; Baker baffle collar at 4393 ft.

5. **Bottom Hole Completion:** Open hole

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** 9,000 gal. (9/2/59); 16,000 gal. (9/3/59)

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** N/A

2. **Filters:** N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	2/70	Average	60	Maximum	
"	1/71		60		
"	7/72		59		
"	2/73		60		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	2/70	Average	1530	Maximum	
"	1/71		1280		
"	7/72		1225		
"	2/73		1775		

3. Annual Volume Injected, gal.
A. 1972 16,885,600 B. 1971 12,681,900 C. 1970 24,576,400

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: MI-11

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O

Operating Company Name and Address: Ford Motor Company, Rouge Plant
Dearborn, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 29 (Month) 01 (Year) 73
2. Latitude and Longitude: 42°18'00"/83°08'48"
3. Well Location (Legal Description): SE 1/4, NW 1/4, NW 1/4, Sec 29, T2S, R11E
4. County: Wayne State: Michigan
5. SIC Classification: 3312

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Liquid coke oven wastes.
2. Date Well Permitted: 8/15/56 Completed:
3. Injection Rate: 15,000,000 gpy
4. Injection Pressure: 278 psi
5. Total Depth of Well: 563 ft.
6. Name, Age, and Depth of Injection Zone: Sylvania, Devonian 482 ft.
7. Date Injection Began: (Day) 15 (Month) 08 (Year) 56
8. Total Volume Injected to Date: 247,000,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	80	clay, gravel
Detroit River	Devonian	80	400	dolomite
Sylvania	Devonian	480	120	sandstone

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Sylvania	Detroit River
(2) Depth (Ft.)	482	80
(3) Thickness (Ft.)	74	400
(4) Formation Fluid Pressure, psi	211	
(5) Lithostatic Pressure, psi	490	
(6) Hydrofracturing Pressure, psi	490	
(7) Age of Unit	Devonian	Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	dolomite

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	20	60	variable	clay, sand	

4. Mineral Resources in Area: Salt is mined near the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste from the manufacture of coke - cyanide = 270 ppm; phenol = 1300 ppm; H_2S = 300 ppm; Ammonium thiocyanate = 1579 ppm; sulfur = 1900 ppm.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: N/A
   D. Temperature: N/A
   E. pH: N/A

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3. **Toxicity:** Cyanide and phenol may be fatal to humans.

4. **Reactivity with Surface Equipment Components:** None

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Filtration, pH adjustment

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate	9		7	483
Injection			2	489
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 7 inch casing - 95 sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: Well acidized when well head pressure reaches and maintains excessive values.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: 30,000 gal. sump; 900 gal. surge tank.

2. Filters: Leaf filters with diatomaceous earth and cartridge filter.

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3. **Pumps:** Gardner Denver duplex reciprocating steam driven pump rated at 100 gpm at 450 psig.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
1960	24.7	25.8
" 1969	24.8	25.8
" 1970	20.8	25.5
" 1972	21.6	25.7

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
1960	177	284
" 1969	441	551
" 1970	158	477
" 1972	89	273

3. Annual Volume Injected, gal.
A. 1972 11,300,000 B. 1971 12,000,000 C. 1970 10,900,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Pressure and flow recorder

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resource.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: MI-12

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** 0
Operating Company Name and Address: Leonard Refineries, Inc.
Alma, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): N/A
4. County: Gratiot State: Michigan
5. SIC Classification: 2900

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Waste effluent from refinery operation.
2. Date Well Permitted: 6/57 Completed:
3. Injection Rate: 20 gpm
4. Injection Pressure: 750 psi
5. Total Depth of Well: 1244 ft.
6. Name, Age, and Depth of Injection Zone: Marshall, Mississippian 1030 ft.
7. Date Injection Began: (Day) (Month) 06 (Year) 57
8. Total Volume Injected to Date: 63,097,192 (1/1/73) (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	207	clay, gravel
Saginaw-Parma	Pennsylvanian	207	443	sandstone, shale
Bayport-Michigan	Mississippian	650	380	shale, dolomite
Marshall	Mississippian	1030		sandstone

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Marshall	Bayport
(2) Depth (Ft.)	1030	650
(3) Thickness (Ft.)	219	380
(4) Formation Fluid Pressure, psi	0.45 psi/ft est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft est.	
(7) Age of Unit	Mississippian	Mississippian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone widespread	shale, dolomite widespread

C. Chemical Characteristics of Formation Fluids: TDS = 24,600 ppm; Cl^- = 15,200 ppm; Na = 4980 ppm; Ca = 3120 ppm; pH = 3.9

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift			variable	clay, gravel	good
Saginaw	443	283	extensive	sand, shale	

4. Mineral Resources in Area: Several small oil accumulations in Gratiot County. There is also considerable coal in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Waste effluent from refinery operation. The waste consists of the foul condensate and spent caustic fulids. Hydroxide = 786 ppm; phenols = 7.7 ppm
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: N/A
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.002
   D. Temperature: N/A
   E. pH: 8.8

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3. **Toxicity:** Total dose of 1.5 grams phenol may be fatal to humans; dose of 1.95 grams of NaOH may be fatal to humans.

4. **Reactivity with Surface Equipment Components:** Possible corrosion of metallic components by caustic hydroxides.

5. **Degradability Level and Rate:** Slow anaerobic degradation of phenol

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Brobably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface			10-3/4	452
Intermediate			7	1025
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 265 sks; 7 inch casing - 225 sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: Open hole

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: N/A

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	N/A	Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	12/69	Average	752	Maximum	
"	12/70		745		
"	12/71		727		
"	12/72		728		

3. Annual Volume Injected, gal.
A. 1972 8,635,320 B. 1971 11,808,856 C. 1970 5,684,520

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: N/A

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: N/A

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: N/A

Well Id. Code: MI-13

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR Operational Status: O
Operating Company Name and Address: Chemetron Corporation
Holland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 42°47'50"/86°07'55"
3. Well Location (Legal Description): NE 1/4, NE 1/4, NW 1/4, Sec 30, T5N, R15W
4. County: Ottawa State: Michigan
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Effluent from pigment manufacturing process.
2. Date Well Permitted: 1966 Completed:
3. Injection Rate: 18,000,000 gpy
4. Injection Pressure: 225 - 250 psi
5. Total Depth of Well: 5895 ft.
6. Name, Age, and Depth of Injection Zone: Cambrian, 4608 ft.
7. Date Injection Began: (Day) (Month) (Year) 66
8. Total Volume Injected to Date: 90,000,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: None - new process

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift				sand, clay	
Marshall				sandstone	

4. Mineral Resources in Area: Oil and gas in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: One disposal well located 300 ft. south.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Pickle liquor of dilute sulfuric acid, 2 to 30% solution.

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: None
   B. Conc. Dissolved Solids, mg/l: N/A
   C. Specific Gravity: 1.0 - 1.125
   D. Temperature: 100°F - 125°F
   E. pH: 1 - 9

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** Corrosive from acid

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Polishing filter and equalization holding.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	13-5/8	32.75# H-40	10-3/4	538
Intermediate	8-3/4	23# J-55	7	4606
Injection		6.5#	2-7/8	4600
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 10-3/4 inch casing - 350 sks; 7 inch casing - 1375 sks.

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: 20 centralizers on 7 inch casing; Otic packer at 4606 ft.

5. Bottom Hole Completion: Open hole completion.

6. Hydraulic Fracturing, Acidizing Programs, etc.: Acidized with 6000 gal. HCl.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: Two large settling tanks.

2. Filters: Two closed delivery plate and frame filters.

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3. **Pumps:** Two injection pumps, centrifugal type, one of which is a stand-by.

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	2/68	Average	135	Maximum	
"	11/72		150		
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	2/68	Average	125	Maximum	
"	11/72		225		
"					
"					

3. Annual Volume Injected, gal.

A. 1972 18,000,000 B. 1971 18,000,000 C. 1970 18,000,000

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Injection pressure, annulus pressure, and injection flow recorder.

B. Sampling Frequency and Water Quality Parameters Measured: Once a day for suspended solids, pH, specific gravity, and chloride.

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: MA-14 stand-by

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: N/A

C. Restrictions of Operation Procedures: Must operate as permitted.

Well Id. Code: MI-14

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** O

Operating Company Name and Address: Chemetron Corporation, Pigment Division
Holland, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 42°47'50"/86°07'55"
3. Well Location (Legal Description): SE 1/4, NE 1/4, NW 1/4, Sec 30, T5N, R14W
4. County: Ottawa State: Michigan
5. SIC Classification: 2899

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Effluent from pigment manufacturing process.
2. Date Well Permitted: 7/69 Completed:
3. Injection Rate: 18,000,000 gpy
4. Injection Pressure: 225 - 250 psi
5. Total Depth of Well: 5910 ft.
6. Name, Age, and Depth of Injection Zone: Cambrian, 4608 ft.
7. Date Injection Began: (Day) (Month) 07 (Year) 69
8. Total Volume Injected to Date: 36,000,000 (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: None - new process

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
N/A				

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	N/A	
(2) Depth (Ft.)		
(3) Thickness (Ft.)		
(4) Formation Fluid Pressure, psi		
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit		
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution		

C. Chemical Characteristics of Formation Fluids: N/A

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
N/A					

4. Mineral Resources in Area: Oil and gas in the area.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: One disposal well 300 ft. north

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Effluent from a pigment manufacturing process including sulfuric acid = 0-15%, hydrochloric acid = 0-15%, ammonium sulfate = 0-15%, ammonia = 0;10%.
2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: None
   - B. Conc. Dissolved Solids, mg/l: N/A
   - C. Specific Gravity: 1.0 - 1.125
   - D. Temperature: 100°F - 125°F
   - E. pH: 1.0 - 9.0

3. **Toxicity:** Acids may be fatal to humans.

4. **Reactivity with Surface Equipment Components:** Corrosive from acids.

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Polishing filtration and equalization holding.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	15		10-3/4	535
Intermediate	8-3/4		7	4730
Injection				
Other				

2. **Type and Amount of Cement, Cement Additives, Emplacement Horizon:** 10-3/4 inch casing - 325 sks; 7 inch casing - 880 sks

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** 8 centralizers on 10-3/4 inch casing.

5. **Bottom Hole Completion:** Perforated completion.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 2 large holding tanks and 4 large equalization tanks.

2. **Filters:** Two closed delivery plate and frame filter presses.

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3. **Pumps:** Two injection pumps, centrifugal type, one of which is stand-by.

VII. OPERATION CHARACTERISTICS

1. **Injection Rate, gpm (During Life of Well to Present)**

Date(s)	1971	Average	120	Maximum	150
"	1972		120		150
"					
"					

2. **Injection Pressure, psi (During Life of Well to Present)**

Date(s)	1971	Average	225	Maximum	250
"	1972		225		250
"					
"					

3. **Annual Volume Injected, gal.**
A. 1972 18,000,000 B. 1971 9,000,000 C. 1970 9,000,000

VIII. SAFETY INFORMATION

1. **Monitoring Program**

A. **Monitoring Devices and Data:** Injection pressure, annulus pressure and injection flow recorder.

B. **Sampling Frequency and Water Quality Parameters Measured:** Once a day for suspended solids, pH, specific gravity, chloride.

C. **Frequency of Measuring Water Levels and Hydrostatic Heads:** N/A

2. **Contingency Plan for Well Failure During Operation:** Use MA-13 as stand-by

3. **Regulatory Aspects**

A. **Construction Requirements:** Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. **Monitoring Requirements:** N/A

C. **Restrictions of Operation Procedures:** Must be operated as permitted.

Well Id. Code: MI-15

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDR **Operational Status:** NOUP
Operating Company Name and Address: Wyandotte Chemical Company
Wyandotte, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 42°13'00"/83°08'12"
3. Well Location (Legal Description): Sec 23, T12N, R2W
4. County: Wayne State: Michigan
5. SIC Classification: 2812

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical process water and solid residues.
2. Date Well Permitted: 10/66 Completed:
3. Injection Rate: 210,000,000 gpy
4. Injection Pressure: 50 psig
5. Total Depth of Well: 1400 ft.
6. Name, Age, and Depth of Injection Zone: Salina, Silurian
850 ft.
7. Date Injection Began: (Day) 24 (Month) 10 (Year) 66
8. Total Volume Injected to Date: 278,023,000 (Gallons)
9. Date Injection Ceased: (Day) 12 (Month) 02 (Year) 68
10. Previous Mode of Disposal: Sedimentation of solids on waste beds with discharge of clarified fluid to Detroit River.

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	60	clay, gravel
Detroit River	Devonian	60	115	dolomite, anhydrite
Sylvania	Devonian	165	115	sandstone, dolomite
Bois Blank	Devonian	280	30	dolomite, chert
Bass Island	Silurian	310	415	dolomite, shale
Salina	Silurian	850		evaporites

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Salina	Detroit River
(2) Depth (Ft.)	850	60
(3) Thickness (Ft.)	600	115
(4) Formation Fluid Pressure, psi	open cavity	0 - 200
(5) Lithostatic Pressure, psi	open cavity	
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Silurian	Devonian
(8) Porosity %	cavity	
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	10°	
(11) Character and Areal Distribution	evaporites	dolomite, evaporites

C. Chemical Characteristics of Formation Fluids: Salt cavity - saturated brine

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	60		sand, gravel	potable
Detroit River			extensive	dolomite	H_2S water

4. Mineral Resources in Area: salt

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: Numerous abandoned salt wells.

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chemical process water. the waste contains 3% solids which are a mixture of $CaCO_3$, $CaSO_4$, CaO, and SnO_2. Solution mining operation and chlorine production.
2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 13,500 - 15,500
   B. Conc. Dissolved Solids, mg/l: 79,000 - 112,000
   C. Specific Gravity: 1.17
   D. Temperature: 120° F
   E. pH: 11.0 - 11.5

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3. Toxicity: None

4. Reactivity with Surface Equipment Components: Corrosive

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection: Probably not sterile at injection; bacterial activity minimal.

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface				
Intermediate	12-1/2	24# JT&C	8-5/8	800
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 400 sks common circulated to grade.

3. Well Head Equipment (Name and Models): None

4. Packers, Centralizers, and Other Subsurface Equipment: None

5. Bottom Hole Completion: Open into abandoned salt cavity.

6. Hydraulic Fracturing, Acidizing Programs, etc.: None

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps:

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)		Average		Maximum	
"					
"					
"					

3. Annual Volume Injected, gal.
A. 19__ B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data:

B. Sampling Frequency and Water Quality Parameters Measured:

C. Frequency of Measuring Water Levels and Hydrostatic Heads:

2. Contingency Plan for Well Failure During Operation:

3. Regulatory Aspects

A. Construction Requirements:

B. Monitoring Requirements:

C. Restrictions of Operation Procedures:

Well Id. Code: MI-16

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP Operational Status: DN
Operating Company Name and Address: Wyandotte Chemical Co.
Wyandotte, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 73
2. Latitude and Longitude: 42°13'31"/83°08'46"
3. Well Location (Legal Description): Sec 23, T12N, R2W
4. County: Wayne State: Michigan
5. SIC Classification: 2818

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Chemical process water
2. Date Well Permitted: 10/66 Completed:
3. Injection Rate: N/A
4. Injection Pressure: N/A
5. Total Depth of Well: 1400'
6. Name, Age, and Depth of Injection Zone: Salina, Silurian 850'
7. Date Injection Began: (Day) N/A (Month) (Year)
8. Total Volume Injected to Date: N/A (Gallons)
9. Date Injection Ceased: (Day) (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0	60	clay, gravel
Detroit River	Devonian	60	115	dolomite, anhydrite
Sylvania	Devonian	165	115	sandstone, dolomite
Bois Bank	Devonian	280	30	dolomite, chert
Bass Island	Silurian	310	415	anhydrite, shale, dol.
Salina	Silurian	850		evaporite

(a)

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Salina	Detroit River
(2) Depth (Ft.)	850	0
(3) Thickness (Ft.)	400	450
(4) Formation Fluid Pressure, psi		0 - 200
(5) Lithostatic Pressure, psi		
(6) Hydrofracturing Pressure, psi		
(7) Age of Unit	Silurian	Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C	10°	10°
(11) Character and Areal Distribution	evaporites	limestone, dolomite sandstone

C. Chemical Characteristics of Formation Fluids: Salt cavity

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Drift	0	60	variable	sand, gravel	fresh
Detroit River	450	400	extensive	dolomite	H_2S

4. Mineral Resources in Area: None

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Chemical process water

2. Physical/Chemical Description
   A. Conc. Suspended Solids, mg/l: 13,500 - 15,500
   B. Conc. Dissolved Solids, mg/l: 79,000 - 112,000
   C. Specific Gravity: 1.17
   D. Temperature: 120° F
   E. pH: 11.0 - 11.5

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3. Toxicity: None

4. Reactivity with Surface Equipment Components: Calcium sulfate scaling

5. Degradability Level and Rate: None

6. Biological Level at Injection and Estimated Biological Level After Injection:
Probably not sterile at injection; bacterial activity minimal

7. Pre-injection Waste Treatment: N/A

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	N/A			
Intermediate				
Injection				
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: N/A

3. Well Head Equipment (Name and Models): N/A

4. Packers, Centralizers, and Other Subsurface Equipment: N/A

5. Bottom Hole Completion: N/A

6. Hydraulic Fracturing, Acidizing Programs, etc.: N/A

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. Holding Tanks and Flow Lines: N/A

2. Filters: N/A

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3. Pumps: ____________________

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ ____________ B. 19__ ____________ C. 19__ ____________

VIII. SAFETY INFORMATION

1. Monitoring Program

   A. Monitoring Devices and Data: ____________________

   B. Sampling Frequency and Water Quality Parameters Measured: ____________________

   C. Frequency of Measuring Water Levels and Hydrostatic Heads: ____________________

2. Contingency Plan for Well Failure During Operation: ____________________

3. Regulatory Aspects

   A. Construction Requirements: ____________________

   B. Monitoring Requirements: ____________________

   C. Restrictions of Operation Procedures: ____________________

Well Id. Code: MI-17

COMPILATION OF INDUSTRIAL AND MUNICIPAL INJECTION WELLS IN THE UNITED STATES

Permit Status: PDP **Operational Status:** O

Operating Company Name and Address: Blunk Laundromat
1111 Round Lake Road - Union Lake, Michigan

I. GENERAL IDENTIFICATION DATA

1. Entry Date of Data: (Day) 01 (Month) 06 (Year) 74
2. Latitude and Longitude: N/A
3. Well Location (Legal Description): SW 1/4, NE 1/4, SE 1/4, Sec. 35, T3N, R8E.
4. County: Oakland State: Michigan
5. SIC Classification: 7211

II. GENERAL DATA ON WELL SITE

1. Type of Waste Injected: Laundromat waste water.
2. Date Well Permitted: 3/67 Completed:
3. Injection Rate: 10,000 gal./day
4. Injection Pressure: 500 psi
5. Total Depth of Well: 1840 ft.
6. Name, Age, and Depth of Injection Zone: Sylvanian, Devonian, 1774
7. Date Injection Began: (Day) (Month) 03 (Year) 67
8. Total Volume Injected to Date: 830,000 (Gallons)
9. Date Injection Ceased: (Day) N/A (Month) (Year)
10. Previous Mode of Disposal: N/A

III. GEOLOGIC INFORMATION

1. Lithology and Stratigraphy
   A. Geological Description of Rock Units Penetrated by Well

(a) Name	(b) Age	(c) Depth	(d) Thickness	(e) Lithologic Description
Drift	Pleistocene	0		
Sunbury	Mississippian	576	29	shale
Berea	Mississippian	605	59	sandstone/silt
Bedford	Mississippian	664	202	shale
Antrim	Devonian	866	143	shale
Traverse	Devonian	1009	289	shale/limestone
Dundee	Devonian	1298	139	limestone
Detroit R.	Devonian	1437	263	anhydrite/dolomite
Sylvania	Devonian	1774		sandstone/dolomite

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B. Geologic Description of Injection Unit and Other Possible Units

	Injection Unit	Confining Bed
(1) Name	Sylvania	Bedford-Dundee
(2) Depth (Ft.)	1774	664
(3) Thickness (Ft.)		700
(4) Formation Fluid Pressure, psi	0.45 psi/ft. est.	
(5) Lithostatic Pressure, psi	1.0 psi/ft. est.	
(6) Hydrofracturing Pressure, psi	1.0 psi/ft. est.	
(7) Age of Unit	Devonian	Miss.-Devonian
(8) Porosity %		
(9) Permeability, millidarcies		
(10) Reservoir Temperature, °C		
(11) Character and Areal Distribution	sandstone	shales, carbonates & evaporites

C. Chemical Characteristics of Formation Fluids: Saline

3. Geohydrology of Fresh Water and Other Useful Aquifers

Name	Depth	Thickness	Areal Extent	Lithologic Character	Fluid Character
Coldwater	300	15	extensive	shale	freshwater
Berea	608	60	extensive	sandstone	freshwater

4. Mineral Resources in Area: No mineral resources are reported in the area of the disposal well.

5. Location of Other Wells, Abandoned Wells, and Other Penetrations in Immediate Hydrologically Affected Area: N/A

IV. WASTE CHARACTERISTICS

1. Technical Description (Including Radioactivity): Laundromat waste water Ca 36,400 ppm, Mg 8,900 ppm, Na 59,000 ppm, K 3,000 ppm, phosphates.

2. Physical/Chemical Description
   - A. Conc. Suspended Solids, mg/l: N/A
   - B. Conc. Dissolved Solids, mg/l: 466,000
   - C. Specific Gravity: 1.19
   - D. Temperature: N/A
   - E. pH: 5.8

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3. **Toxicity:** N/A

4. **Reactivity with Surface Equipment Components:** N/A

5. **Degradability Level and Rate:** N/A

6. **Biological Level at Injection and Estimated Biological Level After Injection:** Probably not sterile at injection; bacterial activity minimal.

7. **Pre-injection Waste Treatment:** Filtration and sedimentation - 3 screens to 3 compartment block settling-holding tanks.

V. WELL DESIGN AND CONSTRUCTION

1. Casing and Tubing

	Hole Size	Casing or Tubing Weight and Grade	Size	Depth Set
Surface	12-1/4	J-55 21 #/ft.	8-5/8	283
Intermediate	7-7/8	J-55 20 #/ft.	7	832
	6-1/4	J-55 15.5 #/ft.	5-1/2	1361
Injection	4-3/4		2	
Other				

2. Type and Amount of Cement, Cement Additives, Emplacement Horizon: 8-5/8 inch casing - 175 sks; 7 inch casing - 175 sks.

3. **Well Head Equipment (Name and Models):** N/A

4. **Packers, Centralizers, and Other Subsurface Equipment:** N/A

5. **Bottom Hole Completion:** Open hole completion.

6. **Hydraulic Fracturing, Acidizing Programs, etc.:** Acidization.

VI. DESCRIPTION OF SURFACE EQUIPMENT

1. **Holding Tanks and Flow Lines:** 3 compartments-cement block settling tank.

2. **Filters:** 3 screens.

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3. **Pumps:** 50 gpm pump

VII. OPERATION CHARACTERISTICS

1. Injection Rate, gpm (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

2. Injection Pressure, psi (During Life of Well to Present)

Date(s)	Average	Maximum
"		
"		
"		

3. Annual Volume Injected, gal.
A. 19__ N/A B. 19__ C. 19__

VIII. SAFETY INFORMATION

1. Monitoring Program

A. Monitoring Devices and Data: Flow volume and pressure monitors.

B. Sampling Frequency and Water Quality Parameters Measured: N/A

C. Frequency of Measuring Water Levels and Hydrostatic Heads: N/A

2. Contingency Plan for Well Failure During Operation: N/A

3. Regulatory Aspects

A. Construction Requirements: Completed, equipped and maintained in a manner that will prevent pollution of fresh water or endanger any natural resources.

B. Monitoring Requirements: Max. injection pressure, daily volume of waste injected, monthly volume of waste injected, accumulative amount of waste injected.

C. Restrictions of Operation Procedures: Must operate as permitted.